

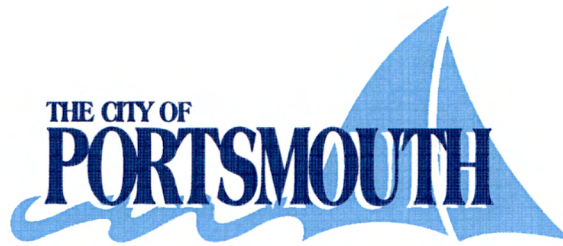
Bauer, Jaime (DEQ)

From: Quick, Diane [quickd@portsmouthva.gov]
Sent: Monday, March 30, 2015 12:47 PM
To: Paylor, David (DEQ)
Cc: Davenport, Melanie (DEQ); Bauer, Jaime (DEQ); Khalil, Youssef
Subject: City of Portsmouth, MS4 draft permit comments
Attachments: (1) Portsmouth Index.pdf; (2) Portsmouth comment letter to David Paylor.pdf; (3) 2015-03-25_Index.pdf; (4) 2015-3-25_Ltr. HRPDC to J.Bauer.pdf; (5) Attachment_1.pdf; (6) Attachment_2.pdf; (7) Attachment_3.pdf; (8) Portsmouth attachment 2, EPA document - Financial Capability.pdf; (9) Portsmouth attachment 3, AOCC implementation plan.pdf

Attached please find our draft MS4 permit comments.

Thank you,

Diane Quick
Manager of Operations/Stormwater
City of Portsmouth
2001 Frederick Blvd.
Portsmouth, VA 23704
(757) 393-8666



Phase I MS4 Draft Permit Comments for the City of Portsmouth

Index

1) Letter

2) Attachment 1

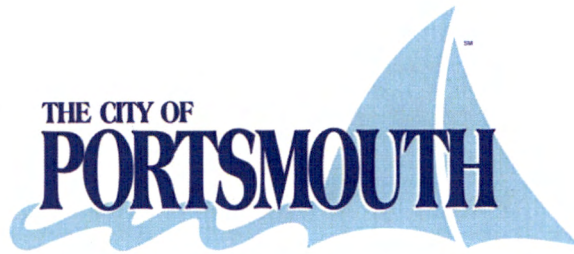
Hampton Roads Planning District Commission (HRPDC) comment letter dated March 25, 2015 and associated attachments

3) Attachment 2

USEPA January 13, 2013 memorandum regarding “Assessing Financial Capability for Municipal Clean Water Act Requirements”

4) Attachment 3

Implementation Plan - Administrative Order for Compliance on Consent



March 27, 2015

Mr. David K. Paylor
Director, Department of Environmental Quality
Commonwealth of Virginia
P.O. Box 1105
Richmond, Virginia 23218

Dear Mr. Paylor,

This is in reference to amendment of the City of Portsmouth's draft Virginia Stormwater Management Program (VSMP), Permit Number VA0088668. The City of Portsmouth appreciates the opportunity to submit comments relative to the recently issued Draft Authorization to Discharge under the Virginia Stormwater Management Program and the Virginia Stormwater Management Act.

In addition to the comments provided by the Hampton Roads Planning District Commission on behalf of the HRPDC's Phase I member jurisdictions, attached and incorporated here by reference, are additional comments particular to the City of Portsmouth.

1. The draft permit requires completion of no less than seven (7) retrofit projects prior to its expiration [Permit 1.B(2)(b), Fact Sheet page 9]. Seven is an arbitrary number and is being applied without regard to the size or financial condition of the permittee. Portsmouth is the smallest and most fiscally stressed of the state's Phase I permittees and its project requirement should be reduced accordingly (see Attachment 2), especially given that DEQ has removed the prior permit's "maximum extent practicable" modifier from the financial obligations it is imposing. We ask that our obligation be reduced to three (3) retrofit projects, if not eliminated entirely. The requirement for a specific number of projects is irrelevant as we are required to reduce pollutant loads by five percent by the end of the permit cycle (HRPDC letter, Section V).
2. The permit requires continued implementation of a sanitary sewer inspection program including 150,000 linear feet of sanitary sewer annually [Permit 1.B(2)(e)(2), Fact Sheet page 10]. The MS4 permit should not include this requirement as Portsmouth is already a party to a Regional Order by Consent (see HRPDC attachments 2 and 3) issued by the State Water Control Board and governing sanitary sewer maintenance and inspections. The City should not be subjected to two separate regulatory documents governing the same subject. At best, this will cause confusion. At worst, it could result in the City being subjected to conflicting but equally binding requirements.
3. The permit requires the permittee to review copies of Discharge Monitoring Reports (DMRs) submitted by VPDES industrial stormwater permitted facilities and potentially to monitor permit compliance [Permit 1.B(2)(g)(3), Fact Sheet page 11]. This requirement is inconsistent with the existing regulatory structure and should be deleted. Portsmouth does not receive copies of DMRs submitted by VPDES industrial stormwater permitted facilities, nor does it have authority to monitor or enforce these permits (HRPDC letter, Section IV-B). If this is a requirement of newly issued VPDES industrial permits, please provide a regulatory reference, as well as a list of permittees in the City of Portsmouth.

Office of the City Manager

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4. The permit requires the permittee to “inspect no less than 15% of the MS4 annually and 100% of the system prior to the expiration of the permit such that all MS4 structures are inspected at least once” [Permit 1.B(2)(h)(1)(d), Fact Sheet page 11]. The meanings of “inspect” and “system” need to be clarified. For example, most of the outfalls in Portsmouth are fully or partially submerged. Are these part of the “system” for the purpose of the inspection requirement? If so, what would qualify as an inspection for these structures?
5. The permit requires screening of a minimum of 100 of the City’s MS4 outfalls each year [Permit 1.B(2)(1)(1), Fact Sheet page 12]. According to the Fact Sheet, the basis for this requirement is that Portsmouth has averaged 110 screenings per year for the past 5 years. It must be noted that the figure of 110 screenings includes re-screenings of structures where concerns were identified during the original inspection. Therefore, Portsmouth has not screened 110 different outfalls per year. We currently screen 75 different outfalls. The proposed permit represents a significant increase in the inspection requirement and Portsmouth does not have the financial or human resources to comply (see Attachment 1).
6. The permit requires design and implementation of a wet weather screening program [Permit 1.B(2)(1)(2), Fact Sheet page 12]. Portsmouth participates in a regional stormwater monitoring program that will, when the system is complete, quantify the loading rates for specific land uses in the region. We ask that the Wet Weather Screening Program requirement be deleted from the permit (HRPDC letter, Section VI-M).
7. The permit requires the permittee to “develop and implement an in-system monitoring program to characterize the stormwater discharges to the MS4, identify pollutants of concern as well as determine the effectiveness of any upstream BMPs...” [Permit 1.C(1), Fact Sheet page 13]. Portsmouth requests that DEQ strike the phrase “determine the effectiveness of any upstream BMPs” and replace it with “establish a baseline for determining baseline loading rates”. This is more consistent with the City’s understanding of the purpose of the in-system monitoring program (HRPDC letter, Section III-A).
8. The permit requires monitoring for *Escheria coli* [Permit 1.C(1)(c)(11), Fact Sheet page 13]. The City asks that this requirement, as well as requirement for pH and dissolved oxygen data, be removed from the permit. Neither the draft Permit, nor the Fact Sheet, provides justification for adding these parameters to the Regional Monitoring Program (HRPDC letter, Section III-B).
9. The permit specifically requires the permittee to develop means and methods of offsetting pollutant loads from construction initiated between July 1, 2009 and June 30, 2014, as well as grandfathered construction after July 1, 2014, where the project’s land cover condition is greater than 16% impervious [Permit 1.D(1)(b)(g) & (h), Fact Sheet page 14]. It is unfair to use newly adopted standards to retroactively punish localities for permitting construction which complied with the standards in place at the time (HRPDC letter, Section II-C).
10. The permit authorizes utilization of stream restoration projects as part of the Chesapeake Bay TMDL Action Plan [Permit 1.D(1)(b)(2)(b), Fact Sheet page 14]. However, shoreline restoration projects are more appropriate for this region. Portsmouth therefore requests that the reference to streamline restoration projects be replaced with, or supplemented by, a reference to shoreline restoration projects.
11. The Fact Sheet (page 9) states that the permittee’s local Erosion and Sediment Control program will address land disturbing activities of 10,000 square feet and greater and allow the permittee

to implement a more restrictive program on land disturbances of 2,500 square feet and greater as necessary for additional water quality protection under the Chesapeake Bay Preservation Act. Portsmouth's VESCP requires use of the more restrictive 2,500 square feet standard throughout the City, therefore the reference to 10,000 square feet should be changed to 2,500 and the reference to the Chesapeake Bay Preservation Act is not necessary.

12. In December 2014 Portsmouth entered into an Administrative Order for Compliance on Consent with EPA (the "AOCC"). The AOCC required Portsmouth to prepare a plan to perform certain specified stormwater management activities, and to submit the plan for EPA review and approval. The plan Portsmouth submitted is attached hereto (attachment 3). We anticipate receiving EPA approval of a final version of this plan in the next few weeks. So that Portsmouth's stormwater management obligations are consolidated into a single governing document to the greatest extent possible, we request that the substantive components of the final approved plan be incorporated into the permit by whatever means DEQ deems most appropriate.
13. The permit requires that the permittee will "seek public participation in identifying potential stormwater management projects for completion" [Permit I.B(1)]. The City of Portsmouth currently presents projects to the public, specifically to the affected community, to provide notice and to gather input based on community knowledge while giving the public the opportunity for input. The City requests that this approach be deemed compliant with the aforementioned permit section.

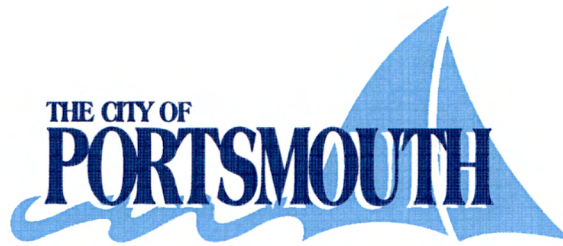
Thank you for the opportunity to share our concerns relative to this permit. We look forward to meeting with DEQ staff on April 13, 2015 to further discuss these concerns.

Sincerely,



John L. Rowe, Jr.
City Manager

C: Melanie Davenport – Water Division Director, DEQ
Jaime Bauer – Environmental Specialist II, DEQ
Nita Mensia-Joseph – Deputy City Manager
Youssef E. Khalil – Director of Public Works
James E. Wright, Jr., PE, CSM – City Engineer
Jeff Miller – Assistant City Attorney
Diane Quick – Manager of Operations/Stormwater



Phase I MS4 Draft Permit Comments for the City of Portsmouth

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1) Letter

2) Attachment 1

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Implementation Plan - Administrative Order for Compliance on Consent



KENNETH L. WRIGHT, CHAIRMAN • CLYDE HAULMAN, VICE-CHAIR • SELENA GUFFEE-GLENN, TREASURER
RANDY KEATON, INTERIM EXECUTIVE DIRECTOR

**MEMBER
JURISDICTIONS**

March 25, 2015

CHESAPEAKE

Jaime L. Bauer
Environmental Specialist II
Department of Environmental Quality
Commonwealth of Virginia
P.O. Box 1105
Richmond, VA 23218

FRANKLIN

GLOUCESTER

HAMPTON

RE: Amend and Reissue the Draft Authorization to Discharge under the Virginia Stormwater Management Program and the Virginia Stormwater Management Act

ISLE OF WIGHT

Dear Ms. Bauer:

JAMES CITY

NEWPORT NEWS

NORFOLK

Thank you for extending the deadline to submit comments from February 27, 2015 to March 31, 2015. The following comments are made to the draft Authorization to Discharge under the Virginia Stormwater Management Program and the Virginia Stormwater Management Act ("Permits") and are submitted by the Hampton Roads Planning District Commission ("HRPDC") on behalf of the HRPDC's Phase I MS4 member jurisdictions ("MS4 Localities" or "Localities").¹

POQUOSON

PORTSMOUTH

The Localities may submit their own comments as well and may choose to append these comments to their own and incorporate them by reference. We appreciate the opportunity to discuss comments with DEQ representatives on Monday, April 13, 2015, from 9:00 a.m. to 12:00 p.m. in the HRPDC Boardroom at 723 Woodlake Drive, Chesapeake, Virginia 23320.

SMITHFIELD

SOUTHAMPTON

I. Introduction

SUFFOLK

The MS4 Localities and HRPDC appreciate the Department of Environmental Quality's ("DEQ's") willingness to address many of our concerns with the draft Permits; however, some concerns remain in both the draft Permits and the draft Fact Sheets accompanying the Permits ("Fact Sheets").

SURRY

VIRGINIA BEACH

The MS4 Localities acknowledge that responsibility for this program has recently been transferred from the Department of Conservation and Recreation ("DCR") to DEQ. For this reason, it is important to note that HRPDC has already expressed concerns about the Bay TMDL provisions in the General Permit for Discharges of Stormwater from Small MS4s ("General Permit") and in the draft stages of the Phase I Permits. Such comments were

WILLIAMSBURG

YORK

¹ The large (Phase I) MS4 jurisdictions are the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Virginia Beach.

made on those Permits in August 2011, December 2012, March 2013, and most recently in a meeting with DEQ on November 7, 2014. The prior comments are attached here and incorporated by reference (see Attachment 1). Many of the comments and concerns have remained consistent since the earliest communication on the topic.

II. Chesapeake Bay TMDL Action Planning

A. The baseline loading rates are inaccurate and their use in calculating baseline pollutant loads will require the MS4 Localities to achieve greater load reductions than necessary to reach their Bay TMDL target loads.

Although not fully explained in the Fact Sheet, we understand that the baseline loading rates in Section I.D. of the Permit were calculated using state-derived estimates of the types, numbers, and efficiencies of stormwater Best Management Practices ("BMPs") installed on the acreage of developed impervious and pervious land in each river basin as of June 30, 2008. These estimates were then used as inputs to the Chesapeake Bay Watershed Model to produce basin-wide 2009 edge of stream ("EOS") loading rates for each pollutant of concern (nitrogen, phosphorus, and total suspended solids). Neither DCR nor DEQ has provided a meaningful explanation of how it arrived at its BMP estimates. It is apparent that DCR's BMP estimates are inconsistent with Locality-documented BMP implementation data as of June 30, 2008. During the Phase II Watershed Implementation Plan ("WIP") process, the Localities found significant discrepancies between local and State BMP data and reported this information to DCR in February 2012, but DCR neither corrected its data nor responded to the Localities' findings.² DCR's failure to use updated BMP data prevented it from calculating accurate baseline loading rates and that problem remains to the present day.

B. The process of averaging flawed loading rates over the entire basin further discounts past BMP implementation by the MS4 Localities.

Baseline loading rates derived using BMP implementation data averaged over the entire James River basin fail to account for greater BMP implementation by localities that are subject to the Chesapeake Bay Preservation Act ("CBPA"), and therefore, over-estimate loading rates for these localities. As directed pursuant to the CBPA, the 38 Virginia localities in the tidal portion of the Chesapeake Bay Watershed (including 16 localities within the HRPDC) have been requiring developers to offset nutrient and sediment loads since 1990 by installing stormwater BMPs. The tidal localities receive only partial credit for the resulting lower loading rates because the basin-wide average BMP

² As an example, one locality in Hampton Roads contains 3,000 acres of developed land. According to DCR's 2009 Progress Run, BMPs in this locality treat only 300 acres. Locality ground-truthed data indicates, however, that BMPs treat three times as many acres for a total of 900 acres. In this example, the state estimates that approximately 1/10 of the area of the locality is treated by BMPs, when in actuality, closer to 1/3 of the acres in the locality have the benefit of BMP treatment.

implementation estimates used by DCR simply offset the higher loading rates of those localities in the non-tidal portion of the basin rather than giving full credit to the localities that actually achieved the reductions.

C. The MS4 Localities should not be required to offset loads from private development that was constructed in accordance with stormwater regulations.

The Localities object to the requirement to offset projects that were approved for impervious cover at greater than 16 percent without stormwater treatment requirements. CBPA localities had programs approved by DEQ/DCR that allowed more than 16 percent of impervious cover and should not be required to offset loads from private development that was in compliance with stormwater regulations in effect at the time of development. The State should not require Localities to retroactively subsidize private development.

The Permit also requires Localities to offset loads from all known land disturbing projects that qualify under the "grandfathering" provision in the Virginia Stormwater Management Program ("VSMP") regulations in Part I.B.2.a. This requirement is not appropriate for the following reasons:

1. If a project is "grandfathered," only portions of the project for which construction commenced within the first Permit cycle and one renewal cycle are grandfathered pursuant to 9 VAC 25-870-48. Therefore such status is only applicable for a given period of time. Localities cannot predict which projects will be constructed in the requisite timeframe.
2. Localities should not have to accept the additional financial burden of offsets when the decision to approve the projects did not factor in this requirement.
3. Some grandfathered projects will never be constructed and Localities should not have to provide offsets for these projects. A determination of grandfathered status would not be made until such time that a project owner indicates intent to begin construction by making application for required City permits. For various reasons many projects which are approved never continue through to construction. The Localities have no way to predict this in advance and thus cannot plan for this requirement.

D. DCR has failed to address earlier requests from HRPDC and the Localities to correct the same deficiencies in the baseline loading rates identified in these comments.

The HRPDC and the Localities alerted DCR (and now DEQ) to the above-described deficiencies on more than one occasion. Such comments were made

in August 2011, December 2012, March 2013, and most recently in a meeting with DEQ on November 7, 2014. See Attachment 1. DCR responded to a number of our questions related to the baseline loading rates, but neither the Localities nor the HRPDC ever received a reasoned explanation and justification for the decision to develop the baseline loading rates in Section I.D. of the Permit using the State basin-wide BMP data and the 2009 Progress Run.

Two of the more obvious examples of this are (i) DCR's failure to revise BMP implementation data when Localities provided updated data for DCR's Phase II WIP data call, and (ii) DCR's reliance on a directive from the Environmental Protection Agency ("EPA") to use the 2009 Progress Run to derive the baseline loading rates rather than exercising its own judgment and discretion to determine whether some other model run would produce more accurate loading rates.³

The Fact Sheets provided by DEQ do not provide a reasoned rationale and justification for using the baseline loading rates in Section I.D. of the Permit. Instead, the Fact Sheets do little more than repeat much of what is in the Permit. The Phase I and Phase II WIPs fail to provide a rationale and justification for the baseline loading rates, and instead, like the Permit, offer only an abbreviated and inadequate explanation of the basis for the rates.

Although courts accord considerable deference to an agency's exercise of its discretion, the agency must exercise that discretion in a way that is not arbitrary and capricious. In short, the agency must provide a reasoned rationale and justification for its action.⁴ It is not enough for an agency to simply identify the basis for its action as DEQ has done.

E. Use of the 2010 No Action Model Run would address the deficiencies in the baseline loading rates.

DEQ can correct the above-described deficiencies by modifying Section I.D. of the Permit to instruct Localities to calculate their baseline loads using loading rates from the 2010 No Action Model Run instead of the 2009 Progress Run (the 2010 No Action Model Run reflects pollutant loads without BMPs). Under this approach, Localities would also submit data on actual BMP implementation and the resulting pollutant load reductions from these BMPs and receive credit for these reductions beyond their calculated baseline loads. This approach would (i) use the most accurate BMP data in the development of loading rates, (ii) avoid the use of inaccurate basin-wide loading rates because locality-specific

³ See August 15, 2011, letter from John Carlock (HRPDC) to Joan Salvati (DCR) and August 31, 2011, email response from Noah Hill (DCR) to Jennifer Tribo (HRPDC), copies of which are in Attachment 1 to these comments.

⁴ See *Chem. Mfrs. Ass'n v. EPA*, 28 F.3d 1259, 1265-66 (D.C. Cir. 1994); *Va. Real Estate Comm'n v. Bias*, 226 Va. 264, 269, 308 S.E.2d 123, 125 (1983); *Env'tl. Defense Fund v. Va. State Water Control Bd.*, 15 Va. App. 271, 277-78, 422 S.E.2d 608, 611-12 (1992); *Johnston-Willis, Ltd. v. Kenley*, 6 Va. App. 231, 241-44, 369 S.E.2d 1, 19-24 (1988); *Atkinson v. Va. Alcoholic Beverage Control Comm'n*, 1 Va. App. 172, 176, 336 S.E.2d 527, 529-30 (1985).

information could be used to calculate more accurate locality-specific loading rates, and (iii) permit localities to obtain credit for all BMPs implemented within the locality up to the effective date of the Permit, which would result in more accurate pollutant load and load reduction calculations.

While we understand that EPA may have directed DCR to frame statewide strategies in terms of pounds of pollutants removed from the 2009 Progress Run to meet the statewide TMDL targets, we believe that DEQ should view this as a reporting requirement. DEQ could comply with EPA's request by requiring Localities to (i) calculate the number of total pounds of pollutants reduced by achieving a five percent reduction from the 2009 Progress Run, and (ii) then express that load reduction as a percent reduction from the 2010 No Action Model Run.

F. TMDL Action Plan and Implementation

In Part I.D.1.b.1., Localities suggest removing the word "approvable" and replacing it with "in accordance with the Chesapeake Bay TMDL Action Plan Guidance." Permittees cannot be subjected to non-compliance by requiring the submittal of "approvable" Action Plans. Permittees who make a good faith effort to submit complete and accurate Action Plans should not be deemed to be non-compliant because DEQ does not approve the Plan for reasons that were not reasonably foreseeable by the permittee when preparing its plan. Alternately, language could be added that permittees who fail to submit revised plans correcting deficiencies identified by DEQ may be deemed non-compliant with the Permit.

Based on the draft Bay TMDL Action Plan guidance, as BMPs are approved by the Bay Program they can also be used to comply with the Permit. It is important to Localities that this provision be included in the final Action Plan guidance.

We request that DEQ revise the Action Plan guidance so that the baseline loading rates reflect the 2010 No Action model run, as explained in Section II.E. of this comment letter. We ask that DEQ work diligently to provide the final Action Plan guidance as soon as possible but no later than the effective date of the Permit

The Localities request a clear definition of "James River Basin." There are areas in Hampton Roads that do not drain to the James River Basin such as East Ocean View in Norfolk, the Lynnhaven River in Virginia Beach, Little Creek in both Norfolk and Virginia Beach, or the Poquoson in Newport News and Back River in Hampton and Newport News.

The Localities ask for clarification on the following sentence in Part I.D.2.a.: "Implementation of BMPs on unregulated lands provided the baseline reduction is subtracted from the total reduction prior to application of the reduction towards meeting the required reductions."

G. TMDL Annual Reporting Requirements

Part I.D.d.5.b. of the Permit should be deleted. Planning for the second Bay TMDL Action Plan should be included in the second Permit. It is not reasonable to plan the second Action Plan before the conditions of the second Permit are known. Additionally, the Localities will have to start planning approximately one year after completing their first Action Plan, prior to the actual implementation and lessons learned timeframe.

III. Monitoring Requirements

A. Regional Monitoring Program

The Localities appreciate DEQ's consideration of the Regional Monitoring Program under development, but the monitoring requirements in Part I.C.1. are not feasible. Monitoring sites were selected to quantify the loading rates for specific land uses in the Coastal Plain. The Monitoring Program was not designed to determine the effectiveness of upstream BMPs. The Study design attempted to avoid drainage areas with BMPs, but this was not feasible in all localities. Any effect of existing BMPs will become part of the baseline loading rate for that drainage area. Once baseline loads are calculated, then the effect of future BMPs may be characterized by the Monitoring Program. The portion of the sentence in Part I.C.1. that states, "... as well as determine the effectiveness of any upstream BMPs as follows" should be removed.

B. pH, Dissolved Oxygen, and E. coli

The requirement to collect pH, dissolved oxygen and E. coli data should be removed from the Permit. Part I.C.1.b. requires that samples be collected four times per year and analyzed for 11 pollutants. The Regional Monitoring Program was designed to collect automated samples during rain events. Flow, conductivity, temperature, and turbidity will be collected using a flow meter and water quality sonde. The samples collected by the automated sampler will be analyzed for total nitrogen, nitrate nitrogen, total phosphorus, orthophosphate, and total suspended solids. Dissolved oxygen and pH cannot be collected by the automated sampler due to holding times, and the water quality sondes that collect dissolved oxygen and pH cannot be used by the Monitoring Program because they must be constantly submerged. The regional monitoring stations were purposely selected to be out of the tidal range and therefore will likely go dry between rain events. Current EPA sampling protocols do not allow for E. coli data to be collected by automated sampler.

Neither the draft Permit nor the Fact Sheet provides any justification for adding these parameters to the Regional Monitoring Program.

C. Reporting Requirements

The monitoring stations are currently being installed, and it may take the first year of the Permit to ensure that all stations are consistently operating properly and collecting usable data. The draft Permit requires that "each annual report shall include a summary of the monitoring results and analyses and an interpretation of that data with respect to long-term patterns/trends." This is beyond the purpose of the Monitoring Program. The Monitoring Program is intended to calculate the baseline loading rates for urban land uses in Hampton Roads. Monitoring data will be submitted in annual reports after Permit year two, but loading rates may not be calculated until the end of the Permit term due to the uncertainty in the magnitude and frequency of rainfall events.

IV. Industrial Inspection Program

A. Industrial and High Risk Runoff Facilities

Part I.B.2.g. requires the permittee to implement a program to identify and control pollutants in stormwater discharges to the MS4 from industrial and high risk runoff facilities (e.g., municipal landfills; other treatment, storage or disposal facilities for municipal waste; hazardous waste treatment, storage, disposal, and recovery facilities; facilities that may be subject to EPCRA Title III, Section 313); and any other industrial or commercial discharges the permittee determines are contributing a substantial pollutant loading to the MS4. This list of the types of facilities that are considered high risk for runoff, including landfills and waste management sites, does not coincide with the list presented in Part I.B.2.g. 1-6. For example, in Part I.B.2.g.6.b. of the Permit, automotive service shops are considered high risk runoff facilities, and they are not included in the introduction. The Permit should not specify the types of industrial facilities to inspect; the Localities should use best professional judgment to determine which facilities pose the greatest risk of polluting their MS4 systems.

B. State Responsibilities

The high risk facilities listed in Part I.B.2.g. are required to be permitted by DEQ. Discharge and effluent limits, housekeeping requirements, and other Permit conditions are set by DEQ in the applicable discharge permits. Requiring MS4 Localities to assume responsibility for facilities that are permitted by DEQ is not required by the stormwater management regulations, is arbitrary, and would divert finite local resources from those functions that are most efficiently and effectively performed by the Localities.

Part I.B.2.g.3. requires Permittees to review Discharge Monitoring Reports ("DMR") that are required to be submitted to DEQ by VPDES permits. Reviewing programs for permit compliance is the responsibility of DEQ. The Localities object to this requirement.

Further, the Localities have expressed concern that some might construe an exercise of authority under these clauses as unenforceable under the doctrine of the "Dillon Rule." The unprecedented shift of these responsibilities from the state to the localities could potentially expose the locality to public criticism, enforcement action, or litigation.

C. Prioritization of Industrial Inspections

Rather than inspect the outfalls of VPDES-permitted facilities, Localities should prioritize industrial inspections, perhaps focusing on those without VPDES permits. Localities should base their prioritized schedule on impairment or areas where there are concerns of pollutants, not those listed in this section. If the state finds these are high polluters, then they should be included in the Industrial Permit program.

V. Stormwater Management Projects through the TMDL Action Planning Process.

Part I.B.1. should be removed from the Permit. Localities will provide a list of stormwater projects 24 months after the Permit effective date as part of the Bay TMDL Action Plan.

The basis for requiring seven retrofit projects in Part I.B.2.b. is unclear and the number of projects is arbitrary. This requirement should be removed from the Permit. Localities are required to develop a Bay TMDL Action Plan and implement projects to reduce pollutant loads by five percent by the end of the Permit cycle. This metric is reasonable and makes a requirement for a specific number of projects irrelevant.

VI. Other Significant Issues

A. Effective Date of Permit and the Annual Reporting Period

Regardless of the Permit effective date, DEQ should ensure the annual reporting period coincides with the fiscal year (FY). If the effective date of the Permit does not coincide with the FY, then adjust the other Permit deadlines accordingly to allow for Locality budget cycles.

B. MS4 Program Plan Development

There is no timeframe provided for the development of the MS4 Program Plan in Part I.A.6. The Localities do not have active MS4 Program Plans; they are drafts developed as part of the Permit application process per DCR's request.

The Localities require time to develop/update the MS4 Program Plan. We suggest allowing the Localities one year to develop/update the MS4 Program Plan. Additionally, the MS4 Program Plan and the Annual Reports should be recognized as different documents, all under this Permit. The MS4 Program Plan spells out the roles, responsibilities, and procedures for implementing Permit requirements, while the Annual Report is a compilation of specific tasks that were accomplished in that specific Permit year.

C. Permit Organization

The third bullet listed in Part I.B.2. requires the permittee to report their strategy to address maintenance of stormwater management controls that are designed to treat runoff solely from the individual residential lot on which they are located. This reporting requirement would be more appropriate in Part I.B.h.2.a.i., which is the section regarding individual residential lot BMPs. The Localities suggest language closer to 9 VAC 25-870-112.B. As an example: "stormwater management facilities designed to treat stormwater runoff primarily from an individual residential lot on which they are located shall demonstrate to the satisfaction of the VSMP authority that future maintenance of such facilities will be addressed through an enforceable mechanism at the discretion of the VSMP authority."

D. Stormwater Management of Roadways

1. Part I.B.2.c.1. requires the Localities to develop an accurate list of permittee maintained roads, streets, and parking lots. The list is supposed to include the street name, the miles of roadway not treated by BMPs, and miles of roadway treated by BMPs, no later than 12 months after the effective date of the Permit. The Localities request that this deadline be extended to 24 months after the effective date of the Permit to allow localities to develop the list in coordination with the Action Plan.
2. Localities request removing the requirement to report the parking lot in Part I.B.2.c.1., as Locality databases are organized by road names.
3. Part I.B.2.c.2. requires the permittee to develop and implement written protocols for permittee maintained roads, equipment maintenance areas, and material storage areas to minimize pollutant discharges. Localities request removing both "equipment maintenance" and "material storage" areas from the list. The high priority City facilities, where equipment maintenance and material storage occurs, will be addressed as part of the SWPPPs that are required in Part I.B.2.i.2.

E. Pest Management

Part I.B.2.d.4. of the Permit requires the Permittee to report the number of acres that are managed under Integrated Pest Management Plans ("IPM"). Localities

request that the requirement be removed. This requirement is not justified or explained in the Fact Sheet.

F. Sanitary Sewer Inspection

Part 1.B.2.e. requires inspection of the sanitary sewer system. These provisions are not appropriate for the Localities as the Localities have different legal obligations that still meet the requirements under applicable provisions of state and federal law. Specifically, since 2007, the Localities have been coordinating a regional approach to establish a consistent and uniform framework for identifying and implementing regional and individual system improvements to be undertaken pursuant to the Special Order by Consent ("Consent Order") and, under that Consent Order, developed Regional Technical Standards addressing the following: (1) data collection and flow monitoring, (2) Sewer System Evaluation Survey (SSES) planning, (3) sewer system condition assessment, (4) rehabilitation planning, (5) hydraulic modeling and performance assessment, (6) regional design guidelines, (7) regional operating guidelines, and (8) other technical requirements. See Attachment 2.

On December 9, 2014, a new Consent Order ("Amended Consent Order") terminated prior Consent Orders⁵ and implemented a sanitary sewer maintenance, operation, and management (MOM) program. The Hampton Roads Sanitation District ("HRSD") has assumed sole responsibility for all aspects of the Regional Wet Weather Management Plan ("RWWMP") and the HRSD MOM implementation in the Federal Consent Decree.⁶

The Localities are completing their required inspections and this requirement should be removed from the Permit.

G. Floatables

Part I.B.2.e.3. requires the development of a program to reduce the discharge of floatables. This requirement should be moved to Part I.B.2.j. Localities continue to address litter through public education and outreach campaigns. Localities should report on the effectiveness of the litter prevention programs instead of site surveys. Remove the fourth bullet in the Specific Reporting Requirements in Part I.B.2.e.3.

H. Illicit Discharges and Spills

1. The Permit requires in Part I.B.2.e. that each Annual Report includes a list of illicit discharges identified, the source, a description of follow-up activities and

⁵ See Attachment 3, p. 5, superseding and terminating Consent Orders issued by the State Water Control Board on September 26, 2007, December 17, 2001, and March 17, 2005.

⁶ *U.S. v. HRSD*, Civ. No. 2:09-cv-481, 2012 U.S. Dist. LEXIS 46984 (E.D.Va. Apr. 2, 2012).

whether the illicit discharge has been eliminated. Localities instead request that a summary of illicit discharges be included in the Annual Report and the details of each be made available by request. If an illicit discharge exceeds the reportable quantity threshold, DEQ is provided detailed information in the 5-day letters as required in Part II of the Permit.

2. Part I.B.e.1. requires the permittee to prohibit, on a case-by-case basis, any individual non-stormwater discharge otherwise allowed under the paragraph that is determined to be contributing significant amounts of pollutants to the MS4. The Localities request further explanation on what is considered a "significant amount" of pollutants. The word "significant" is imprecise, subjective, and unenforceable.
3. Part I.B.f. requires that a list of spills be included in each Annual Report. This section should only refer to reportable spills. It is unnecessary to report spills below the reporting threshold. Additionally, spills that occur at industrial sites and high priority municipal facilities will be tracked under SWPPP requirements.

I. Stormwater Infrastructure Management

1. Part I.B.h.d. requires the permittee to continue its storm sewer inspection program and inspect 100 percent of the MS4 system during the Permit term. Localities typically define the MS4 system as including all roadways, ditches, structures, curb lines, etc. It is not justified to inspect 100 percent of the system in a Permit term. Localities suggest they continue to evaluate the condition of their MS4 system using local knowledge and maintenance activities instead of inspecting 100 percent of the MS4 system during the Permit term. Localities prioritize their resources to the portions of the MS4 system that are in need of improvement. Localities will continue to document their maintenance plan as part of the MS4 Program Plan, with maintenance data such as the number of catch basins serviced, number of street-sweeping miles, and the number of city-owned BMPs maintained, etc.
2. Part I.B.2.h.1.e. requires permittees to dispose of wastes and wastewaters associated with stormwater system cleaning in accordance with local, state, and federal laws and regulations. Localities are required to comply with the law; it is unclear why this would be a Permit requirement.
3. In the specific reporting requirements of Part I.B.h.d., permittees are required to submit written inspection and maintenance procedures with the initial Annual Report. It is unclear why Localities would need to do this when these procedures will be submitted as part of the MS4 Program Plan.
4. In the specific reporting requirements of Part I.B.h.d, the permittee is required to report a list of activities including inspections, maintenance, and repair of stormwater infrastructure. Localities capture this data in multiple database

systems; however, providing a comprehensive list of these tasks each year is an extensive administrative task. Localities suggest providing a summary of the work completed and have the database systems on hand for inspection upon request.

J. City Facilities

Part I.B.2.i.1.d. should be revised to indicate that Localities will maintain municipal vehicles to minimize fluid leaks that discharge to the MS4 system. The municipal yards that house the vehicles will have SWPPP coverage.

K. Public Education/Participation

Part I.B.j.4. requires the permittee to post the MS4 Program Plan on their website no later than 30 days after the effective date of the Permit. As discussed in Section B above, there is no specified timeframe for the development of the MS4 Program Plan. Localities suggest stating that the Permittee post the MS4 Program Plan within 30 days of Plan approval.

L. Dry Weather Screening

Part I.B.2.l.1.a. of the Permit requires the permittee to screen a minimum of 100 of the City's MS4 outfalls each year. Localities suggest changing it to 25 of the City's MS4 structures, which would include catch basins and outfalls. Localities would use professional judgment to determine the areas of concern for screening. The last sentence of Part I.B.2.l.1.a. should be removed to allow for screening locations further upstream.

M. Wet Weather Screening

The wet weather screening program required in Part I.B.2.l.(2) should be removed from the Permit. This requirement is not defined or justified in the Permit or the Fact Sheet. The Regional Monitoring Program is a wet weather monitoring system designed to evaluate 10 to 15 storm events annually, with 40 to 60 samples collected from each station each year, depending on hydrologic conditions. Each locality is dedicating \$84,000/year to the Regional Monitoring Program. Additional wet weather screening is burdensome and not beneficial.

N. Structural and Source Controls Compliance Monitoring and Tracking

In the specific reporting requirements of Part I.B.2.h., the permittee is required to report historical BMPs in the fourth Annual Report. This requirement should be deleted. Localities will report the historic BMPs in each Annual Report and through DEQ's 2015 Historical Data Cleanup Request for Applications.

O. Other TMDL Action Plans

1. The Localities request that DEQ provide guidance on the Non-Bay TMDL Action Plans with a specific focus on bacteria and PCB TMDLs.
2. In Part I.D.2.b.4., the Localities suggest changing “facility of concern” to “high priority municipal facility” to be consistent with the rest of the Permit.
3. In Part I.D.2.g., BMPs that will be implemented in the “next permit term” should be included in the next Permit.
4. In Part I.D.2.g., the last sentence reads: “The permittee shall also evaluate and modify the estimated end date for achieving the applicable wasteload based on information acquired during the Permit cycle.” It is not feasible for Localities to estimate the date for achieving the wasteload for PCBs without additional guidance and identification of BMPs or actions that effectively eliminate PCBs. Additionally, Localities have no control over legacy PCB sources.

P. MS4 Program Implementation

The requirements of section I.B.2. are not proper permit terms as they only restate exiting law and regulation. By doing this in a VPDES permit, DEQ may subject Localities to EPA enforcement of state law and dual exposure to sanctions and penalties.

As an example, the EPA fined Norfolk for an alleged failure to obtain VSMP permits on City of Norfolk construction sites.⁷ Norfolk argued that this was not a violation of the current MS4 permit because the section under which the violation was noted required Norfolk to obtain VPDES Industrial Permits, not General Construction Permits. Norfolk argued that this would be a violation a state law and was, therefore, under the jurisdiction of DCR and not the EPA.

It is not necessary or justified to restate each provision of state law and regulation as a separately enforceable aspect of permit compliance. The Localities request revision to remove any sections that appear to separately require Localities to comply with state law or regulations associated with Virginia Erosion and Sediment Control Law § 62.1-44.15:51, *et seq.* of the Code of Virginia, Virginia Erosion and Sediment Control Regulations 9 VAC 25-840 *et seq.*, the Virginia Stormwater Management Act § 62.1-44.15:24 of the Code of Virginia, or Virginia Stormwater Management Program Regulations 9 VAC 25-870.

⁷ Circa 2010.

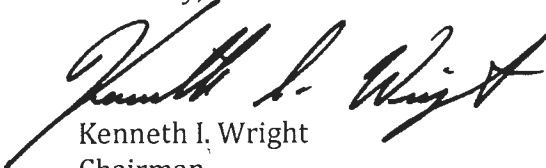
Ms. Jaime L. Bauer
March 25, 2015
Page 14

Q. Definitions

This section includes a reference to the Virginia Stormwater Management Act; however, the citation is for the regulations.

In conclusion, the purpose of planning district commissions, as set out in the Code of Virginia, § 15.2-4207 is "... to encourage and facilitate local government cooperation and state-local cooperation in addressing on a regional basis problems of greater than local significance." The Localities and the HRPDC appreciate your careful consideration of amendments to the Permits. It is our goal to work with DEQ to find reasonable solutions that will benefit all. Given the extent of the comments, the Localities do not support releasing the draft Permits for Public Notice at this time. We look forward to continued discussions on the presented concerns.

Sincerely,



Kenneth I. Wright
Chairman

JS/jc

Attachments

Copy: David Paylor, DEQ
Melanie Davenport, DEQ

Attachment 1



STAN D. CLARK, CHAIRMAN • THOMAS G. SHEPPERD, JR., VICE CHAIR • JAMES D. McREYNOLDS, TREASURER
DWIGHT L. FARMER, EXECUTIVE DIRECTOR/SECRETARY

**MEMBER
JURISDICTIONS**

August 15, 2011

CHESAPEAKE

Ms. Joan Salvati, Division Director
Department of Conservation and Recreation
Division of Stormwater Management
Pocahontas Building
900 E. Main Street, 8th Floor
Richmond, VA 23219

FRANKLIN

GLOUCESTER

Dear Ms. Salvati:

HAMPTON

ISLE OF WIGHT

JAMES CITY

NEWPORT NEWS

NORFOLK

POQUOSON

PORTSMOUTH

The HRPDC is aware that the State has concerns with the data from the 5.3.2 model, and that this has caused a delay in the development of the official 'tool' that local governments will be able to use to submit Phase II scenarios to Virginia. However, the Hampton Roads local governments and members of the Regional Phase II WIP Steering Committee have a multitude of issues and questions that need to be addressed in order for local governments to continue developing their Phase II WIP strategies. The answers to most of the questions are not dependent on the model output. Localities are having trouble assessing and correcting the baseline data and estimating the nutrient reductions of proposed actions because the State has not provided information that is critical to make those calculations. Localities are also concerned about how the locality target loads were developed and whether or not they are equitable.

We request a response to the questions and issues, outlined below, prior to our next Steering Committee meeting on September 1, 2011. We also request that you attend the meeting in order to provide the Steering Committee with an update on Virginia's progress towards Phase II WIP development and to address any concerns of the Committee members.

Critical Information for Developing Phase II Strategies

SOUTHAMPTON

SUFFOLK

SURRY

VIRGINIA BEACH

WILLIAMSBURG

YORK

- 1) What are the loading rates for the different land cover classes? Do these rates vary by physiographic region (coastal plain versus piedmont)? These loading rates are important for localities to have, so they can calculate a reduction from the baseline load for the area treated by a particular BMP.
- 2) Localities need urban loads broken down into pervious versus impervious, so that they can better estimate load reductions from BMPs applied to specific land cover classes.
- 3) Is the State working with EPA to reconcile the differences between Virginia's BMP efficiencies and the Bay Model efficiencies? When will this issue be resolved?

Ms. Joan Salvati
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Concerns about Target Loads

- 1) Localities are concerned that the use of '2009 Progress' model run as the baseline for determining urban stormwater load reductions for all localities creates inequity for localities within the Chesapeake Bay Program Act areas that have been implementing stormwater requirements since 2000. Additionally, the information contained in the '2009 progress' scenario is incomplete. HRPDC suggests that DCR use the '2010 no action' model run to determine the necessary percent load reductions for urban stormwater.
- 2) How are the nutrient reduction goals of each locality influenced by the model effectiveness factors for each segmentshed?
- 3) If the State developed the Phase I WIP load goals using a standard treatment percentage for each BMP for each locality, why are the nutrient and sediment load reductions for localities so disparate?
- 4) How can localities account for the nutrient reductions achieved by the Fertilizer restrictions recently passed by the General Assembly?
 - a. Will there be an input for this in the tool that DCR is developing?
 - b. How will this relate to the Nutrient management plan requirement for localities?
 - i. How can localities account for property owners that do not apply any fertilizer to lawns?
- 5) Virginia's Phase I WIP included a statement that federal properties would be held to a higher implementation level of BMP implementation than non-federal properties. Was this included in the model runs for the Phase I WIP? Will it be included in the model runs for the Phase II WIP?
- 6) What additional programs or implementation levels were required for agriculture? What additional funding has been dedicated to achieving nutrient and sediment reductions from agriculture?

Issues on cataloging and documenting nutrient reductions

- 1) Localities need guidance on how to document pre 2006 BMPs that have not been included in the model, so that they can be included during the recalibration in 2017. Localities also request that the Tool DCR is creating have the ability to estimate the

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Page 3

reductions achieved by these 'missing' BMPs, so that localities can account for that nutrient removal during their planning process.

- 2) Localities have not been receiving credit for some management actions that have Model efficiencies because they have not been reported.
 - a. Please list the BMPs that the State is aware of that have not been reported.
 - b. What is the State's plan to address this during the Phase II process?
- 3) Additional BMPs and efficiencies need to be added to the Model.
 - a. What priorities has the State submitted to EPA?
 - b. What actions is the State taking to establish interim efficiencies for localities to use during the planning process?
- 4) Erosion and Sediment Control
 - a. How were the acres under e and s control determined?
 - b. The BMP loading sheet has a 2025 target for acres under E and S. Does this number refer to the acres that will be under e and s control in the year 2025, or the number of acres that have been controlled during a longer period preceding 2025? If the latter, what is the starting year?
 - c. How is a locality supposed to increase areas under erosion and sediment control when that is a factor of the pace of development?
- 5) How can localities estimate the benefit of tree plantings not associated with reforestation or buffer restoration (ie. Street trees or increased canopy on developed lots)?
- 6) How are septic pumpouts and biosolids applications being tracked?
- 7) The BMP crosswalk spreadsheet indicates that street sweeping can be reported in acres swept or pounds of material collected. Which unit was used for the street sweeping in the load reduction spreadsheets delivered to localities?
- 8) Is the State or EPA concerned about localities assuming urban nutrient management plans and agricultural practices will be implemented indefinitely even though the agreements are only effective for 1-3 year periods?

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August 15, 2011
Page 4

- 9) How does the TMDL account for air deposition, and is there an opportunity for local/state air emissions reductions programs to have an impact on nutrient reductions locally?
- 10) Are the impacts of extreme storms causing major water quality impacts and should we be considering different BMPs to mitigate these extreme storms?

The HRPDC staff, the region's localities, and members of the Chesapeake Bay TMDL Regional Steering Committee have been working diligently to address the state's expectations of the Phase II WIP effort. At the August 4, 2011 meeting of the Regional Steering Committee, the HRPDC staff sensed a growing frustration on the part of the localities and other stakeholders over the lack of important information and guidance from the state that is critical to moving the process forward. We believe that it is essential that we address these gaps at the September meeting.

We appreciate your participation and assistance in this effort. If you have questions or desire to discuss these concerns further, please call Whitney Katchmark or Jennifer Tribo.

Sincerely,



John M. Carlock
Deputy Executive Director

WSK/fh

From: Hill, Noah (DCR) <Noah.Hill@dcv.virginia.gov>
Sent: Wednesday, August 31, 2011 2:16 PM
To: Jennifer Tribo
Cc: Salvati, Joan (DCR)
Subject: FW: Task Completed: Develop Responses to HRPDC Concerns
Attachments: HRPDC Answers.doc; HRPDC_Salvati_Concerns.pdf

Attached are the responses to the question that HRPDC submitted. See you tomorrow.

Noah
Noah M. Hill, Regional Manager
Virginia Department of Conservation and Recreation
Suffolk Regional Office
1548 - A Holland Rd, Suffolk VA 23434
757-925-2392

From: Salvati, Joan (DCR)
Sent: Wednesday, August 31, 2011 8:02 AM
To: Smith, Shawn (DCR); Hill, Noah (DCR)
Subject: Fw: Task Completed: Develop Responses to HRPDC Concerns

From: Davis-Martin, James (DCR)
Sent: Tuesday, August 30, 2011 04:15 PM
To: Salvati, Joan (DCR)
Subject: Task Completed: Develop Responses to HRPDC Concerns

James Davis-Martin
Chesapeake Bay WIP II Project Manager
804-786-1795

Critical Information for Developing Phase II Strategies

1. The loading rates (pounds/acre) can be calculated by dividing the loads (pounds) by the land use (acres). These figures vary by land-river segment, the finest segmentation in the model, so there will be variability based on physiographic region, segmentshed and county.
2. In the revised data set for Phase 5.3.2, the urban loads and BMPs will allow differentiation between regulated and unregulated, pervious and impervious data.
3. The State is working through the Bay Program's Urban Workgroup and Water Quality Goal Implementation Team to resolve the differences. The timeline for completing this important task is not yet clear.

Concerns about Target Loads

1. EPA has dictated using the 2009 Progress model run as the baseline when accounting for new reductions toward meeting the TMDL. We recognize the BMP data in this scenario is imperfect and have asked localities to provide an improved accounting of the BMPs currently on the ground as part of the Phase II Process. The BMP implementation targets used in developing the Phase I WIP and the TMDL were based on consistent statewide treatment of the various landuses with BMPs. There was no distinction made for Bay Act areas in that process. Bay Act localities should actually be advantaged in this process because they have a much longer record of BMP implementation that can be accounted for through the Phase II process, thereby moving them closer to the TMDL implementation levels.
2. The local targets and reduction goals have been provided as edge of stream loads, so the delivery factors that the model uses to adjust loads for in-stream processes through delivery to tidal waters do not influence them.
3. The Phase I process applied a percent treatment for a BMP on the applicable landuse. So, variations in landuses between localities will produce a different mix of BMPs. Additionally, because the loading rates vary by land-river segment, the load reduction per unit of BMP will also vary at that scale.
4. The details of how the model will credit the fertilizer restriction have not been finalized. It is anticipated that it will be accounted for on a state wide basis and will produce a reduced loading rate in the urban pervious landuse that would be evident to localities in future progress runs of the model.
 - a. There will not be an input for this in the initial version of the VAST.
 - b. This is not related to Nutrient Management plan requirements, except that it is possible that a lawn with a nutrient management plan and soil tests that call for application of phosphorus could do so.
 - i. If there is a local program that promotes, tracks and verifies that fertilizer is not being applied to lawns, this should be documented as a Phase II strategy. We could then work with EPA to include a BMP in the model that would give credit similar to the loads from hay without nutrients (unmanaged grass).
5. The Phase I WIP was run on the 5.3.0. model that did not have a breakout of federal lands, so it was not possible to apply the different treatment levels. The Phase II WIP will use the 5.3.2. model which does include the federal landuse breakout, so the higher treatment level could be modeled.
6. The specifics of the Phase I actions identified for agriculture and information on current programs and funding are in the WIP I document, Section 5. <http://www.dcr.virginia.gov/vabaytmdl/documents/vatmdlwip.pdf>

Issues on cataloging and documenting nutrient reductions

1. Localities can provide information on pre-2006 BMPs at any time. The information needed are the specifics of the BMP type, the amount of the BMP (linear feet, acres, systems or acres treated as appropriate), the date the BMP was installed and the location of the BMP. The VAST will not work for estimating the effects of these BMPs as their effects are already accounted for in the Phase 5.3.2 model calibration process. A locality could use the VAST to estimate the loads, but the loads would not be representative of what would be produced through a recalibrated model in 2017.

2. The state reports all BMPs for which we have the necessary information. (What BMP, How Much, Where, and When). Generally, the agricultural BMP data collected through Federal and State cost-share programs is very reliable. New efforts to track voluntarily installed BMPs in agriculture are currently being assessed. The urban and septic BMP data are less reliable. Generally, we have tried to use information reported through existing regulatory programs and permits for these sectors. Unfortunately, this data often lacks one or more of the required elements which results in under reporting. The Phase II process will allow localities to report BMPs on the ground through the VAST. The VAST may also serve as a tool that localities may choose to use to report annual implementation progress in the future, until better tracking systems can be developed.
3. The state is working with EPA to address agricultural nutrient management, the ability to stack other BMPs with continuous no-till, septic denitrification practices with 25% and 75% efficiencies, and a capture/reuse BMP for nurseries. These will be available for Phase II planning using the VAST. Additionally, we are working on the efficiency of stream restoration and the urban BMP efficiency differences discussed earlier. If you have other priorities that you think are critical, please communicate those as part of the Phase II process.
4. Acres under E&S are reported to the state by DCR regional offices that compiled locality data. The E&S practice is an annual practice, so the 2025 acres treated are for that year only. The E&S BMP applies to the construction landuse in the model. This landuse is changed based on the model's assumptions on growth rates, and may not be representative of current conditions. If the model's construction landuse area is significantly different than what is on the ground, a locality may benefit from reporting E&S as a % of the landuse treated. So if the locality's E&S program has a 95% compliance rate, they could apply the BMP to 95% of the available landuse.
5. Urban tree planting is planting trees on urban pervious areas at a rate that would produce a forest-like condition over time. The tree planting BMP includes any tree plantings on any site except those along rivers and streams. Plantings along rivers and streams are considered riparian buffers and are treated differently. The definition of tree planting does not include reforestation. Reforestation replaces trees removed during timber harvest and does not result in an additional nutrient reduction or an increase in the forest acreage. The intent of urban tree planting is to eventually convert the urban area to forest. If the trees are planted as part of the urban landscape, with no intention to convert the area to forest, then this would not count as urban tree planting.
6. Septic pumpouts are currently only tracked in Chesapeake Bay Act localities as part of the Bay Act Annual Reports from localities. The Department of Health is working to improve the accounting of septic pumpouts in non-Bay Act localities. Virginia is the only Bay state that currently reports biosolids applications into the Bay Model. Biosolids are applied in the model to the localities where the application is made based on the permits. The model treats biosolids similarly to other organic nutrient sources (manures and poultry litter).
7. The spreadsheet reports street sweeping as the acres of streets swept annually.
8. The acres under agricultural Nutrient management plans are reported based on the acres with a current nutrient management plan based on the effective dates in the plans. Urban nutrient management is tracked annually.
9. Yes. Local/State initiatives and programs that exceed the actions required by the national air standards can be reported to the bay program for credit.
10. Yes. Major storm events cause significant water quality impacts. BMPs to address these extreme storms are generally cost prohibitive, but if there are some effective and affordable solutions, they should be considered.



THOMAS G. SHEPPERD, JR., CHAIRMAN • KENNETH I. WRIGHT, VICE-CHAIR • JAMES D. McREYNOLDS - TREASURER
DWIGHT L. FARMER, EXECUTIVE DIRECTOR/SECRETARY

MEMBER
JURISDICTIONS

December 19, 2012

CHESAPEAKE

Mr. David C. Dowling
Policy and Planning Director

FRANKLIN

Department of Conservation and Recreation
203 Governor Street

GLOUCESTER

Suite 203
Richmond, VA 23219

HAMPTON

RE: Amend and Reissue the General Permit for Discharges of Stormwater
from Small MS4s

ISLE OF WIGHT

Dear Mr. Dowling:

JAMES CITY

The following comments on the draft General Permit for Discharges of Stormwater from Small MS4s (the "Permit") are submitted by the Hampton Roads Planning District Commission ("HRPDC") on behalf of the HRPDC's MS4 member jurisdictions (the "MS4 Localities" or "Localities").¹

NEWPORT NEWS

NORFOLK

I. Introduction

POQUOSON

PORTSMOUTH

Although the HRPDC and the MS4 Localities appreciate the Department of Conservation and Recreation's ("DCR's") willingness to address many of our concerns during the advisory panel process leading up to publication of the Permit, we continue to have serious concerns with the baseline loading rates in Section I.C. of the Permit. We have expressed these same concerns a number of times during development of the Permit and the

SOUTHAMPTON

SUFFOLK

SURRY

Phase I and Phase II Watershed Implementation Plans ("WIPs"), and it is disappointing to see not only that the deficiencies remain unaddressed, but also that our concerns appear to have been largely ignored in both the Permit and the draft Fact Sheet accompanying the Permit (the "Fact Sheet").

VIRGINIA BEACH

WILLIAMSBURG

YORK

¹ The small (Phase II) MS4 jurisdictions are the cities of Poquoson, Suffolk and Williamsburg, and Isle of Wight, James City and York counties. The Phase I MS4 jurisdictions are the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Virginia Beach.

II. The Baseline Loading Rates are Not Accurate and Their Use in Calculating Baseline Pollutant Loads Will Require the MS4 Localities to Achieve Greater Load Reductions than Necessary to Reach Their Bay TMDL Target Loads.

The baseline loading rates are the starting point for determining the baseline pollutant loads for the localities covered by the Permit, and ultimately for determining the load reductions required of the localities. The higher the baseline loading rates, the higher the calculated baseline pollutant loads and the greater the reductions required of the localities. Accordingly, the importance of including accurate baseline loading rates in the Permit cannot be over-emphasized.

Although not fully explained in the Fact Sheet, we understand that the baseline loading rates in Section I.C. of the Permit were calculated using state-derived estimates of the types, numbers, and efficiencies of stormwater Best Management Practices ("BMPs") installed on the acreage of developed impervious and pervious land in each river basin as of June 30, 2008. These estimates were then used as inputs to the Chesapeake Bay Watershed Model to produce basin-wide 2009 edge of stream ("EOS") baseline loading rates for each pollutant of concern (nitrogen, phosphorus, and total suspended solids). We have identified three compounding flaws in the approach used to derive the baseline loading rates.

A. The Rates are Based On Flawed State-Derived Estimates and Do Not Accurately Reflect Locally Documented BMP Implementation Levels.

Although DCR has not provided a meaningful explanation of how it arrived at its BMP estimates, it is apparent that DCR's BMP estimates are inconsistent with Locality-documented BMP implementation data as of June 30, 2008. As you know, during the Phase II WIP process, DCR shared its BMP data with the HRPDC and the Localities and asked us to check its data against local BMP implementation data. The Localities found significant discrepancies between local and State BMP data and reported this information to DCR in February 2012, but DCR neither corrected its data nor responded to the Localities' findings.² DCR's failure to use readily available and updated BMP data prevented it from calculating accurate baseline loading rates.

² As an example, one locality in Hampton Roads contains 3,000 acres of developed land. According to DCR's 2009 Progress Run, BMPs in this locality treat only 300 acres. Locality ground truthed data indicates, however, that BMPs treat three times as many acres for a total of 900 acres. In this example, the state estimates that approximately 1/10 of the area of the locality is treated by BMPs, when in actuality, closer to 1/3 of the acres in the locality have the benefit of BMP treatment.

B. Even if DCR Had Incorporated Accurate Locality Derived BMP Data in the Permit, the Baseline Loading Rates Would Still be Flawed Because they Reflect Average Rates Over the Entire Basin.

Baseline loading rates derived using BMP implementation data averaged over the entire James River basin fail to account for greater BMP implementation by localities that are subject to the Chesapeake Bay Preservation Act ("CBPA"), and therefore, over-estimate loading rates for these localities. As directed pursuant to the CBPA, the 38 Virginia localities in the tidal portion of the Chesapeake Bay Watershed (including 16 localities within the HRPDC), have been requiring developers to offset nutrient and sediment loads since 1990 by installing stormwater BMPs. The tidal localities receive only partial credit for the resulting lower loading rates because the basin-wide average BMP implementation estimates used by DCR to derive basin-wide baseline loading rates simply offset the higher loading rates of those localities in the non-tidal portion of the basin rather than giving full credit to the localities that actually achieved the reductions.

C. Section I.C. Fails to Provide the Localities with the Opportunity to Take Credit for BMPs Installed After June 30, 2008.

We understand from remarks by DCR staff during the Soil and Water Conservation Board meeting on September 28, 2012 that the failure to provide localities with the opportunity to take credit for BMPs installed after June 30, 2008 was an oversight that DCR intends to correct before the Permit is finalized. While we are pleased that DCR intends to correct this flaw, we are unsure if it intends to provide the public with an opportunity to comment on the amended Section I.C. before the end of the comment period. If not, we urge you to do so. This is an important amendment to the Permit and the public should have an opportunity to comment on the language proposed by DCR.

IV. DCR Has Largely Ignored Earlier Requests from HRPDC and the Localities to Correct the Same Deficiencies in The Baseline Loading Rates Identified in these Comments.

As noted above, HRPDC and the Localities have alerted DCR to the above described deficiencies on more than one occasion in the past. While DCR has responded to a number of our questions related to the baseline loading rates, it has either not responded to others or has provided responses that fail to explain or offer a reasoned explanation and justification for its decisions to develop the baseline loading rates in Section I.C of the Permit using the State basin-wide BMP data and the 2009 Progress Run. Two of the more obvious examples of this are (i) DCR's

Mr. David C. Dowling

December 19, 2012

Page 4

failure to even respond to the discrepancies in DCR's and the Localities' BMP implementation data identified by the Localities even though the Localities were responding to a request from DCR, and (ii) DCR's reliance on a directive from the Environmental Protection Agency ("EPA") to use the 2009 Progress Run to derive the baseline loading rates rather than exercising its own judgment and discretion to determine whether some other model run would produce more accurate loading rates.³

Also, we were disappointed to find that the Fact Sheet does not provide a reasoned rationale and justification for using the baseline loading rates in Section I.C of the Permit. Instead, the Fact Sheet does little more than repeat much of what is in the Permit. Like the Permit, the Fact Sheet suggests that the rationale and justification for the baseline loading rates can be found in Virginia's Chesapeake Bay Watershed Implementation Plan (WIP).⁴ However, it is apparent from a review of both the Phase I and Phase II WIPs that they too fail to provide a rationale and justification for the baseline loading rates, and instead, like the Permit, offer only an abbreviated and inadequate explanation of the basis for the rates.

Although courts accord considerable deference to an agency's exercise of its discretion, the agency must exercise that discretion in a way that is not arbitrary and capricious. In short, the agency must provide a reasoned rationale and justification for its action.⁵ It is not enough for an agency to simply identify the basis for its action as DCR has done here. It must also provide a reasoned rationale and justification for its action by explaining why it selected these rates over other rates and why the rates it selected are preferred over those proposed by others such as HRPDC and the Localities. We respectfully submit that DCR's failure to respond to our concerns regarding the discrepancies in the state and Locality BMP data, its total reliance on EPA's directive to use the 2009 Progress Run to produce the baseline loading rates, and its failure to offer a reasoned rationale and justification for using basin-wide average baseline loading rates is arbitrary and capricious and must be corrected before the Permit is finalized.

³ See August 15, 2011, letter from John Carlock (HRPDC) to Joan Salvati (DCR) and August 31, 2011 email response from Noah Hill (DCR) to Jennifer Tribo (HRPDC), copies of which are Attachment A to these comments.

⁴ See Fact Sheet at 20.

⁵ See *Chemical Mfrs. Ass'n. v. Environmental Protection Agency*, 28 F.3d 1259, 1265-66 (D.C. App. 1994); *Virginia Real Estate Comm'n v. Bias*, 226 Va. 264, 269, 308 S.E.2d 123, 125 (1983); *Environmental Defense Fund v. Ramirez*, 15 Va. App. 271, 277, 422 S.E.2d 608, 611-12 (1992); *Johnston-Willis v. Kenley*, 6 Va. App. 231, 241-44, 369 S.E.2d 1, 19-24 (1988); *Atkinson v. Virginia. Alcoholic Beverage Control Comm'n*, 1 Va. App. 172, 176, 336 S.E.2d 527, 529-30 (1985).

V. Use of the 2010 No Action Model Run Would Address the Deficiencies in the Baseline Loading Rates.

DCR can readily correct the above described deficiencies by modifying Section I.C of the Permit to instruct localities to calculate their baseline loads using loading rates from the 2010 No Action Model Run instead of the 2009 Progress Run (the 2010 No Action Model Run reflects pollutant loads without BMPs). Under this approach, localities would also submit data on actual BMP implementation and the resulting pollutant load reductions from these BMPs from 2006 through July 2013 and receive credit for these reductions beyond their calculated baseline loads. This approach would (i) provide for use of the most accurate BMP data in the development of loading rates, (ii) avoid the use of inaccurate basin-wide loading rates because locality-specific information would be used to calculate more accurate locality-specific loading rates, and (iii) permit localities to obtain credit for all BMPs implemented within the locality up to the effective date of the Permit, which would result in more accurate pollutant load and load reduction calculations.

While we understand that EPA has directed DCR to frame statewide strategies in terms of pounds of pollutants removed from the 2009 Progress Run to meet the statewide TMDL targets, we believe that DCR should view this as a reporting requirement without dictating the way in which a state actually measures reductions by sector. If DCR wishes to comply with EPA's request, it should do so by requiring localities to (i) calculate the number of total pounds of pollutants reduced by achieving a five percent reduction from the 2009 Progress Run, and (ii) then express that load reduction as a percent reduction from the 2010 No Action Model Run. This latter calculation may result in load reductions greater than five percent of the load based on the 2009 Progress Run in the first permit year, however, it is balanced by the fact that localities will be able to credit their documented BMPs from 2006 to 2013 towards this percent reduction. Although those localities that have implemented fewer BMPs prior to the effective date of the Permit will need to achieve greater pollutant reductions than those localities that have implemented more BMPs since 1990, this approach will ensure that the burden is shared fairly by all.

VI. Neither the Permit nor the Fact Sheet Refer to Methodologies for Calculating Nutrient Reductions and Guidance for Developing Action Plans.

Virginia's BMP Clearinghouse (which is still under construction) and the Chesapeake Bay Program's guidance are not consistent with respect to methodologies for calculating nutrient reductions and the differences between some of the methods and calculations are not inconsequential. Therefore, in order to develop consistent and effective strategies for pollutant load reduction, localities need to know which BMPs can be included in their Chesapeake Bay TMDL Action Plans ("Action Plans") and the BMP efficiencies that should be assigned to those

BMPs. Localities also need to know the equivalencies that can be used for non-traditional BMPs so that they can use these equivalences to obtain credit for their implementation. Although flexibility is appreciated, localities must have confidence that the methodologies and equivalencies used for their calculations will ensure compliance with their obligations under the Permit.

A related concern involves the absence of any guidance on the content of the Action Plans required by Section I.C.2 of the Permit. Although Section I.C.2 lists the subjects that must be addressed in the Action Plans, neither it nor the Fact Sheet provide localities with any guidance as to DCR's expectations regarding the minimum acceptable content of the Action Plans. Without such guidance, localities are left to assume what is required of them and thereby risk being charged with non-compliance despite their best efforts to submit and implement complete Action Plans.

By the foregoing, we do not mean to suggest that DCR should try to include the methodologies and guidance in the Permit. To the contrary, we do not believe it would be appropriate to include either the methodologies or the guidance as permit conditions given their technical nature and anticipated length and the need for flexibility. Rather, the Fact Sheet should announce DCR's intention to publish a separate document containing the methodologies and guidance before the Permit's effective date and following public notice and the opportunity for comment. The Maryland Department of the Environment has recognized the need to assist Maryland's localities in fulfilling their MS4 permit obligations and has provided guidance for that purpose.⁶ We know of no reason why DCR cannot do the same.

Sincerely,



Thomas G. Shepperd
Chairman

JLT/jc

Attachment

Copy: David Johnson, DCR
Ginny Snead, DCR

⁶ See Maryland Department of the Environment, Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated: Guidance for National Pollutant Discharge Elimination System Stormwater Permits (June 2011 Draft).



THOMAS G. SHEPHERD, JR., CHAIRMAN • KENNETH I. WRIGHT, VICE CHAIR • JAMES O. McREYNOLDS, TREASURER
DWIGHT L. FARMER, EXECUTIVE DIRECTOR/SECRETARY

March 22, 2013

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Mr. David C. Dowling
Policy and Planning Director
Department of Conservation and Recreation
203 Governor Street
Suite 203
Richmond, VA 23219

RE: Comments on the Draft Arlington County MS4 Permit

Dear Mr. Dowling:

The following comments on the draft Authorization to Discharge Under the Virginia Stormwater Management Program and the Virginia Stormwater Management Act permit for Arlington County, Virginia (VA0088579) (the "Permit") are submitted by the Hampton Roads Planning District Commission ("HRPDC") on behalf of the HRPDC's Phase I MS4 member jurisdictions (the "MS4 Localities" or "Localities").¹ The comments are listed in general order of importance, with miscellaneous errors and proposed clarifications included at the end of the comments.

I. Introduction

The Localities are commenting on the draft Permit because we understand that the Department of Conservation and Recreation ("DCR") intends to use it as a template for all Phase I MS4 permits issued in the Commonwealth. Accordingly, we assume that the Localities will be directly affected by those conditions in the final Permit that are not unique to Arlington.

Further, as you know, we expressed serious concerns about the Bay TMDL provisions in the General Permit for Discharges of Stormwater from Small MS4s (the "General Permit") when commenting on that permit last fall. Although the General Permit has not been issued, it appears that DCR has not made the changes proposed in our comments because the Bay TMDL section in the draft Permit is virtually identical to the Bay TMDL section in the General Permit. Therefore, we attach our comments on the General Permit and incorporate them by reference (see Attachment).

¹ The HRPDC Phase I MS4 Localities are the Cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth and Virginia Beach.

II. The permit appears to penalize urbanized Localities that were effectively prevented from early adoption of standards more stringent than those adopted by the Soil and Water Conservation Board in 2011.

Section I.D.1.b.1 (g) requires the permittee's Bay TMDL Action Plan to include:

[t]he means and methods to offset the increased loads from new sources initiating construction between July 2009 and June 30, 2014 that disturb greater than one acre as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post development stormwater management facilities

Section I.D.1.b.1 (h) requires the Action Plan to include the same means and methods for grandfathered projects constructed after July 1, 2014. Together, these sections appear to penalize urbanized Localities that did not have more stringent standards in place before DCR adopted its standards in the fall of 2011. DCR's stormwater rule adoption process was lengthy and the draft rule included a variety of proposed discharge standards over the years. Given the changing nature of these draft standards, the uncertainty about integration of the Bay TMDL Watershed Implementation Plan ("WIP") requirements and the stormwater regulation, the time necessary to draft and adopt new ordinances, and grandfathering provisions written into the regulation, it is unreasonable to expect that localities would adopt new ordinances and standards until the state's programs were finally in place. In addition, the urbanized Localities had approved standards that had not been questioned by DCR and the Localities could not have been expected to anticipate being held accountable for the difference in load between the new state standards and the Localities' existing local requirements.

As background, DCR's Chesapeake Bay Local Assistance Division established a baseline annual load of phosphorous for Tidewater Virginia and corresponding baseline impervious surface value, or average land cover condition. An analysis of the Chesapeake Bay watershed in Virginia identified the average land cover condition for impervious area as 16 percent. Using these inputs and an average annual rainfall of 43 inches, the baseline existing land use condition pollutant load value for phosphorus was calculated to be 0.45 lb/ac/year. DCR gave localities the option to adopt this value as the pre-developed default for the entire locality or to calculate a watershed or locality-wide pre-developed annual load and corresponding impervious value, and designate a watershed-specific or locality specific average land cover condition. As an example, the locality-wide calculated average impervious area for Norfolk was 53 percent with a locality calculated phosphorus load of 1.23 lbs/ac/year (using the Simple Method). The difference between the pre- and post-development pollutant load represents the increase in pollutant load that must now be controlled by appropriate BMPs under the Permit. Had Norfolk (and other urbanized Localities) been in a position to adopt early stringent standards, the Locality would not now be facing such dramatic load reduction requirements under sections I.D.1.b)1(g) and (h) with their accompanying adverse economic impacts.

Therefore, given the unfair burden that the offset requirement places on urbanized Localities, sections I.D.1.b)1(g) and (h) should be removed from the first permit cycle unless state funding is available to implement projects that can meet the specified offsets.

III. MS4 Localities should not be required to perform inspections and implement programs to identify and control pollutants from facilities for which DEQ has permitting responsibility.

Section I.B.2.h requires the permittee to

implement a program to identify and control pollutants in stormwater discharges to the MS4 from industrial and high risk runoff facilities (e.g., municipal landfills; other treatment, storage or disposal facilities for municipal waste; hazardous waste treatment, storage, disposal and recovery facilities; facilities that are subject to EPCRA Title III, Section 313) and any other industrial or commercial discharges the permittee determines are contributing a substantial pollutant loading to the MS4.

These high risk facilities are required to be permitted by the Department of Environmental Quality ("DEQ"), and therefore, should be DEQ's responsibility. In addition, discharge and effluent limits, housekeeping requirements, and other permit conditions are set by DEQ in the applicable discharge permits. Requiring MS4 Localities to assume responsibility for facilities that are permitted by DEQ is not required by the stormwater management regulations, is arbitrary, and would divert finite local resources from those functions that are most efficiently and effectively performed by the Localities. The Permit should be revised to clearly state that the permittee's responsibility for discharges contributing substantial pollutant loads to the MS4 is limited to identifying those that are unpermitted and reporting them to DEQ. This would result in a more efficient and effective distribution of effort that would lead to greater water quality improvements.

IV. Other Significant Issues

A. The permit could be construed to restrict the permittee's use of vacuum trucks to remove MS4 blockages.

In providing that "[t]he permittee shall collect contaminated flush water associated with storm sewer maintenance and shall dispose of it in accordance with appropriate law and regulation", section I.B.2.i.4 appears to seriously restrict the most commonly used and effective way of removing blockages in the MS4. Vacuum trucks are equipped with high-pressure hoses and use potable water to break up the blockages and vacuum the water and debris from the storm sewer. The water that is vacuumed from the storm sewer (which is made up of stormwater and potable water) is decanted and disposed into the storm drains. The remaining debris in the vacuum tank is processed at a dewatering facility. The water seeping from the debris is also generally discharged into the storm drain. By requiring the permittee to "collect" contaminated flush water, section I.B.2.i.4

appears to prohibit returning any of the flush water to the storm sewer, thereby severely restricting the use of this practice.

If granted permission by the owner and operator of a POTW, the MS4 Localities could dispose of the flush water in the sanitary sewer. However, given the high cost of wastewater treatment capacity, we believe it makes no sense to discharge the flush water to the sanitary sewer system when there is no evidence that returning it to the storm system has any potential to adversely impact water quality. In addition, many localities, such as those in the Hampton Roads region, are operating under consent orders that require them to minimize infiltration and inflow to their sanitary sewer systems. Forcing localities to dispose of the flush water in the sanitary sewer systems would conflict with and undermine Locality efforts pursuant to these orders and decrees. Therefore, we ask that DCR either i) delete section I.B.2.i.4 and add flush water from vacuum trucks to the list of authorized discharges in section I.A.1 of the Permit, or ii) establish appropriate BMPs that Localities may implement prior to discharge of flush water to the storm sewer.

B. It is unfair to subject permittees to non-compliance by requiring the submittal of "approvable" Action Plans.

Section I.D.1.b requires that a permittee "develop and submit to the Department for its review and acceptance an 'approvable' phased Chesapeake Bay TMDL Action Plan." Permittees that make a good faith effort to submit complete and accurate Action Plans should not be deemed to be in non-compliance because DCR does not approve the Plans for reasons that were not reasonably foreseeable by the permittee when preparing its plan. DCR's concern that it have a remedy should permittees submit plans that are substantially deficient or that fail to correct deficiencies identified by the DCR can be fairly addressed by revising section I.D.1.b to remove the reference to "approvable" plans and adding language to the effect that permittees that fail to submit revised plans correcting deficiencies identified by DCR shall be deemed to be in non-compliance with the permit. .

V. The permit includes several unnecessary or unworkable tracking, recordkeeping, or reporting requirements.

The draft Permit would needlessly divert finite local resources from important program activities by requiring the Localities to undertake unnecessary tracking, recordkeeping and/or reporting activities that are unnecessary, impossible to perform, or for which the agency may already collect the information.

1. Section I.B.2.b requires the permittee to provide a list of projects that qualify for grandfathering under 4 VAC 50-60-48 before the permittee has had an opportunity to identify those projects that qualify for grandfathering. This section should be modified to require the permittee to include a list of grandfathered projects in the annual reports required by the Permit.

2. The second sentence in section I.B.2.f.1 imposes an unreasonable and counterproductive burden on permittees by requiring them to identify those non-stormwater discharges into the MS4 that are authorized by section I.A.1.b. Identifying and reporting on hundreds, if not thousands of such discharges would divert finite local resources from more important and effective program activities with little or no water quality benefit. Further, it is reasonable to assume that authorized non-stormwater discharges that are contributing significant amounts of pollutants to the MS4 will be identified during the inspections and monitoring required by the Permit. Therefore, the second sentence in section I.B.2.b should be deleted.
3. Section I.B.2.k requires that each annual report provide a summary of voluntary retrofits conducted on private property within the permittee's jurisdiction. Although permittees may be involved in the approval of some retrofits on private property, they will not be notified of all or even most of them (e.g., tree planting, replacement of turf with other ground cover, etc.). Therefore, this reporting requirement should be deleted because it will only provide partial data that will not accurately reflect retrofits within the permittee's jurisdiction.
4. Section 1.B.2.a requires that each annual report include a summary of the number of inspections and enforcement actions. If this information can already be tracked by DCR through the e-permitting system, it seems duplicative to require the information in the annual reports.

VI. The permit also contains several miscellaneous errors and provisions for which clarifications or corrections are required.

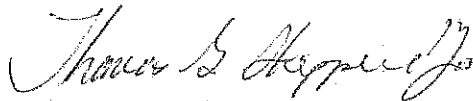
The following provisions of the Permit include typographical errors or require clarification.

1. Section I.A.4 requires the submittal of both "each fiscal year's budget including its proposed capital and operation and maintenance expenditures necessary to accomplish the activities required by this permit" and a "fiscal analysis." The Permit should clearly explain the difference between these two submittals.
2. It appears that the reference to section I.B.2.i.7 in section I.B.2.b.6 should be to section I.C.4 instead of section I.B.2.i.7.
3. Retrofits and tree plantings will differ from one locality to the next depending on a variety of factors unique to each locality. Therefore, we assume that the retrofitting and tree planting provisions in section I.B.2.c will be applied only to Arlington based on its individual circumstances. If not, the Localities would object to including the same provisions in their permits unless they can be shown to be appropriate based on their individual circumstances.

Mr. David C. Dowling
March 22, 2013
Page 6

4. The "specific reporting requirement" in section I.B.2.g should reference "spills" rather than "illicit discharges."
5. Section I.D.1.b.1(d) references sources existing as of June 30, 2008 in line 240, and yet existing sources are defined in line 216 as those existing as of June 30, 2009. The Fact Sheet (see page 19) lists the applicable date as June 30, 2009. The June 30, 2008 date appears to be a typographical error and should be June 30, 2009 instead.
6. Sections I.D.1.b.2(a) is confusing and should be reworded for clarity. The section currently states: "Implementation of BMPs on unregulated urban lands provided the baseline reduction is subtracted from the total reduction prior to application of the reduction towards meeting the required reductions." It is unclear which reductions are intended and it would be helpful if DCR would include an example here. Clarification will allow permittees to appropriately consider this element in the development of their Action Plans.
7. Section I.D.1.c.2)(d) lists one of the minimum requirements of the Action Plans and currently states: "Implementation of means and methods sufficient to meet the required reductions of POC loads from existing sources defined in this permit in accordance with the Chesapeake Bay TMDL Action Plan." Based on the discussion in the Fact Sheet at page 18, it appears that the reference should be to the WIP instead of the Action Plan.
8. Section 1.D.1.d.5.(a) requires tracking and reporting of "temporary credits" or offsets. The term "temporary credits" should be defined to clarify the reporting requirement.

Sincerely,



Thomas G. Shepperd
Chairman

JLT/jcc

Attachment – Letter dated December 19, 2012

Copy: David Johnson, DCR
Ginny Snead, DCR

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November 6, 2014

By Email

Melanie D. Davenport, Director
Water Division
Department of Environmental Quality
Commonwealth of Virginia
P.O. Box 1105
Richmond, VA 23218
melanie.davenport@deg.virginia.gov

Re: Hampton Roads Planning District Commission ("HRPDC") and MS4 Permits

Dear Ms. Davenport:

Thank you for agreeing to meet with us on Friday, November 7, 2014. I am writing to provide some detail in preparation for the conversation and to propose an Agenda to assist in making efficient and effective use of your time. The list that is provided is a set of discussion points HRPDC developed in cooperation with the localities. The list of concerns is not universal to all localities and is not intended to be a position paper for the HRPDC or the localities. The list is intended to help focus the conversation on some important questions about the process and the content of the MS4 draft permits.

We look forward to discussing this with you at your office on **Nov. 7, 2014 at 9:00 AM.** In the meantime, please do not hesitate to contact me if you have any questions at 804.775.4710 (Direct).

Sincerely,



Dale G. Mullen



Agenda

DEQ/ HRPDC

DEQ Central Office

629 E Main St, Richmond - 11th Floor Conference Room

November 7, 2014; 9:00 AM – 11:00 AM

1. Introductions
2. Purpose and Goals of Meeting
3. Status of Draft Permits
4. Points of Discussion
 - a. Monitoring requirements
 - b. Industrial inspections
 - c. Action Plan assumptions and requirements
 - d. Planning and retrofitting on prior developed lands
 - e. Locality specific numbers for dry weather screening etc.
5. Path Forward and Next Steps
6. Adjourn

MS4 Permit Discussion – DEQ and HRPDC – 11/7/14
(Page references match Prince William County Draft dated 9/4/14)

1. Monitoring Requirements [Part I C (p.20-22)]:

Issues:

- The monitoring in this section is not suited for the Coastal Plain.
- Trash and floatables monitoring is a remnant of Arlington's permit and is not necessary in Hampton Roads.
- Biological stream monitoring is not appropriate in coastal/tidal waters.
- Ambient water quality monitoring in a tidal area such as Hampton Roads is not a good mechanism to track the impact of stormwater loads on water quality.

Proposed Solutions:

- Hampton Roads localities are developing a regional monitoring network to track the nutrient loads coming from developed lands within MS4s. Each locality will host two stations. This monitoring should be substituted for the ambient water quality monitoring in the permit.
- DEQ should consult ODU and USGS on the appropriate biological monitoring for the tidal waters common in Hampton Roads.

2. TMDL Action Plan – Chesapeake Bay Watershed TMDL Planning [Part 1 D.1b.1f-g (p.23)]:

Issues:

- Localities are not getting full credit for BMPs installed prior to 2009. Localities have still not received a list from DEQ of the pre-2009 BMPs that were included in the 2009 Progress model run used as the baseline for reduction calculations.
- Localities are concerned about the requirement to offset projects that were approved for greater than 16% impervious cover without stormwater treatment requirements. CBPA localities had programs approved by DEQ/DCR that allowed greater percentages of impervious cover. Localities should not be required to offset loads from private development that was in compliance with stormwater regulations in effect at the time of development.
- Localities are concerned about the requirement to offset loads from grandfathered projects that were approved under the II.C. Technical criteria. DEQ set the grandfathering conditions, not local governments.
- Localities are concerned about the impact of changing BMP efficiencies on permit compliance.

Proposed Solutions:

- Allow localities to use a "2010 No Action" scenario to determine their baseline loads and report all BMPs installed since 2006 to be used for credit towards their pollutant load reductions.
- Remove the requirement to offset loads from CBPA activities.
- Remove the requirement to offset loads from grandfathered projects.

- Add a provision to this section that protects localities from permit noncompliance if BMP efficiencies are modified by DEQ or the Bay Program following development of their Chesapeake Bay TMDL Action Plan.

3. Reduced Flexibility for Locality Stormwater Planning

a. Retrofitting on Prior Developed Lands [Part I B.2c (p.8)]:

Issues:

- This section overrides the Action Plan section by requiring completion of a particular number of projects 6 months prior to the end of the permit cycle.
- The Action Plan section already requires the development of the action plan and implementation of the projects to reduce 5% of the load reductions by the end of the permit.
- The number of retrofit projects is irrelevant to the pounds of pollutant removed, and is not an appropriate metric for measuring progress towards pollutant removal goals.

Proposed Solution:

- Remove this section on the permit and rely on the TMDL Action Plan provisions to achieve water quality goals.

b. Planning and Prioritization [Part I B.1 (p.6)]:

Issues:

- This provision requires a locality to develop a list of conceptual projects and conduct a cost benefit analysis to select priority project discussed in Part I.B.1.
- Localities do not make management decisions based solely on the cost of the project and the amount of pollutants it removes.
- Localities may consider ancillary benefits of the practice and alignment with other locality goals rather than just cost and pollutant removal when selecting projects.
- This provision intervenes in a locality's existing CIP and BMP prioritization and selection process and inappropriately inserts DEQ into local planning processes.

Proposed Solutions:

- If the provision in Part I.B.1 requiring localities to implement a certain number of projects outside their TMDL Action Plan requirements is removed, then this provision will no longer apply.
- If the requirement to implement priority projects is not removed, then this planning provision should be deleted because it interferes with a locality's ability to make decisions based on what is in the best interest of its citizens.

4. Industrial and High Risk Runoff [Part I B.2h (p.11)]:

Issues:

- DEQ appears to be requiring localities to do compliance checks on other DEQ permits.
- DEQ administers the permits and appears to be delegating its responsibility to the locality.

Proposed Solution:

- Locality resources would be better spent focusing on industrial facilities that do not have DEQ permits.

5. Illicit Discharges [Part I.B2.f.2 (p.10)]:

Issue:

- Sanitary sewer inspections are already regulated by the Special Order by Consent (SOC), which is currently being amended.

Proposed Solution:

- This provision should not appear in the MS4 permit as well, and is a violation of the safe harbor statute invoked by the existence of the SOC.

6. Locality-specific Permit Numbers

Recommendation:

- Sections that refer to numeric requirements [ie: Part I B.2m (p.18): Dry Weather Screening Program and Part I B.2i.1 (p.13): Storm Sewer Infrastructure Management] should be tailored to each locality.

Attachment 2



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

TIDEWATER REGIONAL OFFICE

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L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

Francis L. Daniel
Regional Director

STATE WATER CONTROL BOARD ENFORCEMENT ACTION

SPECIAL ORDER BY CONSENT

ISSUED TO

the HAMPTON ROADS SANITATION DISTRICT, the cities of CHESAPEAKE, HAMPTON, NEWPORT NEWS, POQUOSON, PORTSMOUTH, SUFFOLK, VIRGINIA BEACH and WILLIAMSBURG; the counties of GLOUCESTER, ISLE OF WIGHT, and YORK; the JAMES CITY SERVICE AUTHORITY; and the town of SMITHFIELD

SECTION A: Purpose

This is a Consent Special Order issued under the authority of Va. Code § 62.1-44.15(8a) between the State Water Control Board and the Hampton Roads Sanitation District, the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the counties of Gloucester, Isle of Wight, and York; the James City Service Authority; and the town of Smithfield for the purpose of resolving certain alleged violations of environmental laws and regulations. This Order supercedes and replaces the Consent Special Order issued to the City of Hampton and the Hampton Roads Sanitation District on October 7, 2002.

SECTION B: Definitions

Unless the context clearly indicates otherwise, the following words and terms have the meanings assigned to them below:

1. "Board" means the State Water Control Board, a permanent citizens' board of the Commonwealth of Virginia as described in Va. Code §§ 62.1-44.7 and 10.1-1184.

2. "Code" means the Code of Virginia (1950), as amended.
3. "DEQ" means the Department of Environmental Quality, an agency of the Commonwealth of Virginia as described in Code § 10.1-1183.
4. "Director" means the Director of the Department of Environmental Quality.
5. "Discharge" means the addition of any pollutant or combination of pollutants, including untreated sewage, to surface waters from any point source, as defined in 9 VAC 25-31-10, et seq.
6. "Fiscal Year" means the fiscal year used by HRSD, the Hampton Roads Localities and the Commonwealth of Virginia, which runs from July 1 of one calendar year through June 30 of the following calendar year.
7. "Hampton Roads Localities" means the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the counties of Gloucester, Isle of Wight, and York; the James City Service Authority; and the town of Smithfield.
8. "Hampton Roads Locality" or "Locality" means one of the Hampton Roads Localities.
9. "HRPDC" means the Hampton Roads Planning District Commission, a political subdivision of the state. The purpose of planning district commissions, as set out in the Code of Virginia, Section 15.2-4207 is "...to encourage and facilitate local government cooperation and state-local cooperation in addressing on a regional basis problems of greater than local significance".
10. "HRSD" means the Hampton Roads Sanitation District, a political subdivision created by a 1940 Act of the General Assembly of Virginia and charged with the responsibility to provide sewage treatment services for the communities in the Hampton Roads metropolitan area.
11. "Order" means this document, also known as a Consent Special Order.
12. "Regional Office" means the Tidewater Regional Office of the Department of Environmental Quality.
13. "Regulations" means 9 VAC 25-31-10, et seq. - Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation.
14. "STP" means sewage treatment plant.

SECTION C: Findings of Fact and Conclusions of Law

1. HRSD owns and operates an interceptor sewer system, which includes both gravity and force mains, and nine (9) STPs, which serve the Hampton Roads area (HRSD System). Discharges of treated wastewater from the STPs into State waters are regulated by VPDES permits issued by the Board.
2. The Hampton Roads Localities individually own and operate sanitary sewer collection systems which collect sewage within their individual jurisdictional boundaries and deliver it to the HRSD System for treatment.
3. Although individually owned and operated, these sewage collection and treatment systems are physically interconnected at numerous locations to form a regional system with approximately 450,000 connections, 5,819 miles of gravity sewers, 1,577 pumping stations, and 1,121 miles of force mains. The regional system covers a 2,000 square mile service area, serves a population of over 1.6 million, and conveys and treats an average of over 165 million gallons of sewage each day.
4. Due to pipe breaks, electrical outages, infiltration and inflow, insufficient capacity in the collection, interceptor and treatment systems, and other factors, untreated sewage has been and is being discharged from various locations in the HRSD System and the individual sanitary sewer collection systems of the Hampton Roads Localities. The low-lying nature of the Hampton Roads region and corresponding high groundwater table, together with periodic widespread flooding in the region's urbanized areas are significant factors contributing to the discharge of untreated sewage.
5. Section 62.1-44.5.A of the Code and the Regulations at 9 VAC 25-31-50.A prohibit the discharge of sewage except as authorized by a permit issued by the Board. The Board has not issued HRSD or the Hampton Roads Localities permits authorizing said discharges of untreated sewage. Accordingly, the Board finds that HRSD and the Hampton Roads Localities have violated Va. Code § 62.1-44.5.A and 9 VAC 25-31-50.A.
6. For many years, HRSD and the Hampton Roads Localities have worked diligently and spent tens of millions of dollars testing and making repairs and improvements to their respective systems to minimize, and, where possible, prevent such unpermitted discharges of sewage. These efforts notwithstanding, however, unpermitted discharges of sewage continue to occur from the HRSD System and from the individual sanitary sewer collection systems of the Hampton Roads Localities. Accordingly, HRSD and the

Hampton Roads Localities have agreed to expand their efforts to include measures that are designed to address both the regional and individual sanitary sewer collection system capacity and performance conditions that continue to cause or contribute to unpermitted discharges of sewage.

7. HRSD, the Hampton Roads Localities, and the Board have agreed to a two-phased approach to this initiative.
8. The first phase is principally a data collection, evaluation and plan development program that consists of both regional and individual elements. The regional element will require the use of uniform standards to identify the infrastructure projects needed to provide the collection system, interceptor system and treatment capacity required to cost-effectively manage peak wet weather flows throughout the Hampton Roads sanitary sewer system. The individual element is designed to identify, characterize, and cost-effectively address conditions that contribute to unpermitted discharges. This element is also intended to provide for system repairs that require prompt attention.
9. The second phase will provide for the implementation of long-term capacity enhancement and sewer rehabilitation plans, including construction of the regional infrastructure projects and individual system improvements identified in this first phase.
10. DEQ and the United States Environmental Protection Agency (USEPA) have also agreed to work cooperatively to address sanitary sewer overflows within both HRSD's and the Hampton Roads Localities' sewage collection systems. To that end, DEQ and USEPA have agreed that DEQ will process, for the Board's approval, an administrative order addressing the items referenced above as "phase one" of the initiative and settling the Localities' liability for sewage overflows. USEPA, for its part, has unilaterally issued an Administrative Order which addresses EPA's view of HRSD's responsibilities with respect to correction of sanitary sewer overflows and anticipates that it will seek a court order which will incorporate the corrective action requirements of its Administrative Order and which will assess appropriate civil penalties for sanitary sewer overflows that have occurred within HRSD's portion of the regional collection system. DEQ has agreed to work with USEPA and HRSD in the development of the proposed court order. Notwithstanding the foregoing, HRSD and DEQ agree that nothing in this paragraph binds HRSD to enter into such a court order.
11. HRSD and the Localities will seek to have EPA conform EPA's Administrative Order to be materially consistent with this Consent Order. In addition HRSD intends to make best efforts to comply with both this Consent Order and EPA's Order and because HRSD has always fully complied with similar State Orders,

HRSD and the Localities do not believe a federal court order is necessary to address HRSD's performance of the "phase one" program. However, in the spirit of intergovernmental cooperation, HRSD will enter into good faith negotiations with DEQ and EPA toward the development of a federal court order to (1) impose appropriate civil penalties for past sewer overflows and (2) address any appropriate "phase two" capital projects required of HRSD.

12. To facilitate a coordinated regional approach and to establish a consistent and uniform framework for identifying and implementing regional and individual system improvements to be undertaken pursuant to this Order and during the second-phase of work, HRSD and the Hampton Roads Localities have developed Regional Technical Standards addressing the following: (1) data collection and flow monitoring, (2) Sewer System Evaluation Survey (SSES) planning, (3) sewer system condition assessment, (4) rehabilitation planning, (5) hydraulic modeling and performance assessment, (6) regional design guidelines, (7) regional operating guidelines, and (8) other technical requirements. HRSD and the Hampton Roads Localities have agreed to use the Regional Technical Standards as they proceed with the work and activities required by this Order. The Regional Technical Standards are attached and incorporated into this Order as Attachment 1.
13. HRSD and the Hampton Roads Localities also have concluded that the work and activities required by this Order can be efficiently implemented to achieve the most cost-effective solutions only through a coordinated effort involving the sharing of information and a cooperative approach to decision-making on matters that extend beyond their individual systems.
14. To facilitate the cooperative approach and coordinated effort so critical to the success of the regional initiative embodied in this Order and in future phases of sanitary sewer overflow ("SSO")-related work and activities, HRSD, the Hampton Roads Localities and the HRPDC have entered into a Memorandum of Agreement ("MOA"). The MOA is an enforceable contract, which among other things, defines the roles, responsibilities, and obligations of the parties to the Agreement related to consultation between and among the parties, the sharing of data and information between and among the parties, and compliance with the Regional Technical Standards. The MOA also establishes a dispute resolution process designed to quickly resolve any conflicts which might arise between and among the parties. The MOA is attached, but is not incorporated into this Order, as Attachment 2. HRSD and the Hampton Roads Localities agree to promptly provide the DEQ with notice of and any amendments to the Memorandum of Agreement.

SECTION D: Agreement and Order

By virtue of its authority in Code § 62.1-44.15(8a), the Board orders HRSD and the Hampton Roads Localities, and they hereby agree, to undertake and complete the following actions:

1. HRSD shall perform the actions described in Appendix A to this Order.
2. The Hampton Roads Localities shall perform the actions described in Appendices B through N identified below to this Order.
3. Regional Wet Weather Management Plan.

In cooperation with the other parties to this Order, HRSD and the Hampton Roads Localities shall jointly develop, and within 74 months of the effective date of this Order, submit to the DEQ for approval, a final Regional Wet Weather Management Plan. The Plan shall be based on data collected from the flow and pressure meters and the system model and shall analyze a full range of capital and operating alternatives designed to improve system performance and thereby reduce the occurrence of un-permitted discharges both short term and long term. The Plan shall identify, quantify, prioritize, and propose a schedule for implementing regional system enhancements and address the funding of such enhancements between HRSD and the Hampton Roads Localities. The Plan shall include short and long term operating plans to maximize available capacity in the system through effective and proactive operations. HRSD and the Hampton Roads Localities shall implement the approved Plan in accordance with the approved schedule.

4. HRSD and the Hampton Roads Localities shall comply with the Regional Technical Standards that are attached to and incorporated into this Order as Attachment 1. The parties agree that minor changes may be made in the Regional Technical Standards without triggering a modification of this Order, provided that such changes are the subject of unanimous agreement of the Hampton Roads Localities' Utility Directors and the General Manager of the HRSD and are approved by the Director of DEQ's Tidewater Regional Office.
5. All submittals required by this Order shall be mailed to: Department of Environmental Quality, Tidewater Regional Office, 5636 Southern Blvd., Virginia Beach, VA 23462 Attn: Francis L. Daniel, Regional Director, or his successor.

SECTION E: Administrative Provisions

1. The Board may modify, rewrite or amend any provision of this Order on its own motion after notice and opportunity to be heard. On motion of any party, with the consent of all the parties to this Order and for good cause shown, the

Board may modify, rewrite or amend the provisions of Sections D.3 and D.4. above. The Board may modify, rewrite or amend other individual obligations of HRSD or a Locality imposed in the Appendices hereto on motion of that party for good cause shown.

2. This Order addresses and resolves all system overflows and releases from the sewer systems owned by the Hampton Roads Localities and know or reported to the DEQ up to the date of execution of this Order by the Hampton Roads Localities. In consideration of the commitments made herein to address and prevent future overflows and releases, no penalties are imposed at this time. This Order shall not preclude appropriate enforcement actions by other federal, state or local regulatory authorities, or citizen's suits against the Hampton Roads Localities for matters addressed herein. However this Order shall preclude any actions against the Hampton Roads Localities to the extent such claims are barred by the Clean Water Act § 309 (g), or by Virginia Code § 62.1-44.15 (8f).
3. This Order shall not preclude appropriate enforcement actions by the Board or the Director, or by other federal, state or local regulatory authorities, or citizen's suits against HRSD. HRSD specifically waives any protection that this Order may provide pursuant to § 309 (g) of the Clean Water Act with respect to actions brought by USEPA, including without limitation actions seeking civil penalties.
4. For purposes of this Order and subsequent actions with respect to this Order, HRSD and the Hampton Roads Localities admit the jurisdictional allegations, but do not admit or deny the factual findings and conclusions of law contained herein. This Order is made by agreement and with the consent of the parties and does not constitute an admission of violation of any federal, state or local law, rule, regulation, certificate, permit, or standard.
5. HRSD and the Hampton Roads Localities consent to venue in the Circuit Court of the City of Richmond for any civil action taken by DEQ to enforce this Order.
6. HRSD and the Hampton Roads Localities declare they have received fair and due process with respect to the entry of this Order under the Administrative Process Act, Code § 2.2-4000, et seq., and the State Water Control Law, and waive their right to any hearing or other administrative proceeding authorized or required by law or regulation, or to judicial review of any issue of fact or law contained herein. Nothing herein shall be construed as a waiver of HRSD's or the Hampton Roads Localities' right to any administrative proceeding for, or to judicial review of, any action taken by the Board to terminate, change the

terms of, or enforce this Order, or any other Board action that arises from the facts stated herein.

7. Failure by HRSD or any Hampton Roads Locality to comply with its respective individual obligations under the terms of this Order shall constitute a violation of an order of the Board by the party who fails to comply. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of additional orders as appropriate by the Board or the Director as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority or citizen's suits against the Hampton Roads Localities for matters not addressed herein. However, this Order shall preclude any actions against Hampton Roads Localities barred by Clean Water Act § 309(g), as provided by Va. Code § 62.1-44.15 (8f), for all matters addressed herein.
8. If any provision of this Order is found to be unenforceable for any reason, the remainder of this Order shall remain in full force and effect.
9. HRSD and the Hampton Roads Localities shall be responsible for failure to comply with their individual obligations under this Order unless compliance is made impossible by earthquake, flood, other act of God, war, strike, the actions, or inactions, of another party to this Order or such other occurrence beyond their control. Any party in noncompliance must show that such circumstances resulting in noncompliance were beyond its control and not due to a lack of good faith or diligence on its part. HRSD and the Hampton Roads Localities shall notify the Director of the Regional Office in writing when circumstances are anticipated to occur, are occurring, or have occurred that may delay compliance with their individual obligations or cause noncompliance with their individual obligations under this Order. Such notice shall set forth:
 - a. the reasons for the delay or noncompliance;
 - b. the projected duration of such delay or noncompliance;
 - c. the measures taken and to be taken to prevent or minimize such delay or noncompliance; and
 - d. the timetable by which such measures will be implemented and the date full compliance will be achieved.

Failure to so notify the Director of the Regional Office within ten (10) working days of learning of any condition listed above, which the party intends to assert will result in the impossibility of compliance, shall constitute waiver of any claim of inability to comply with a requirement of this Order. Notwithstanding, the notification deadline shall be within five (5) working days if, given the nature of the force majeure event, waiting ten (10) working days

would prejudice the Director's ability to assess the claimed force majeure event.

10. This Order is binding on the parties hereto, their successors in interest, designees, and assigns.
11. This Order shall become effective upon execution by the Director or his designee, HRSD and the Hampton Roads Localities. Notwithstanding the foregoing, HRSD and the Hampton Roads Localities agree to be bound by any compliance date, which precedes the effective date of this Order.
12. This Order shall continue in effect as to each party hereto until the Director or Board terminates the Order as to that party upon thirty (30) days written notice to the party or parties with respect to whom it is to be terminated. Provided such action meets the definition therein, a termination shall be a case decision within the meaning of Va. Code § 2.2-4019 and Rule 2A:2 of the Rules of the Supreme Court of Virginia. Termination of this Order, or of any obligation imposed in this Order, shall not operate to relieve HRSD and the Hampton Roads Localities from their respective obligations to comply with any statute, regulation, permit condition, other Order, certificate, certification, standard, or requirement otherwise applicable.
13. The requirements in each appendix to this Order are the individual obligations of the party named in the appendix, and no party shall be liable for noncompliance with the requirements in the appendix of another party.
14. By entering into this Order, HRSD and the Hampton Roads Localities do not waive any defenses or immunities available to them at law, including, but not limited to, those set forth in Section 15.2-970 of the Code of Virginia.

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Special Order by Consent
HRSD and Hampton Roads Localities
Page 10 of 52

By their signatures below, HRSD and the Hampton Roads Localities voluntarily agree to the issuance of this Order and agree to be bound by the terms hereof.

Date: Sept 26, 2007

By: Francis L. Daniel
Francis L. Daniel

The terms and conditions of the Order are voluntarily accepted by HRSD.

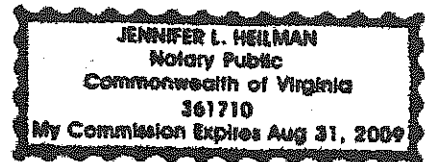
Date: 9/19/07

By: WMBVN
General Manager

The foregoing instrument was acknowledged before me this 19th day of September by Edward Henrich, General Manager of HRSD, on behalf of HRSD.

Jennifer L. Heilman
Notary Public #361710

My commission expires: August 31, 2009



The terms and conditions of the Order are voluntarily accepted by:

Date: 9/20/07

By:

[Signature]
City Manager

Commonwealth of Virginia
City of Chesapeake

The foregoing instrument was acknowledged before me this 20 day of September by William E. Harrell, City Manager, on behalf of the City of Chesapeake.

Wanda B. Futrell
Notary Public

My commission expires: 30 September 2011



Wanda B. Futrell
Commonwealth of Virginia
Notary Public
ID #188712

The terms and conditions of the Order are voluntarily accepted by:

Date: 9/14/07

By:

Jesse T. Wallace, Jr.
City Manager

Commonwealth of Virginia
City of Hampton

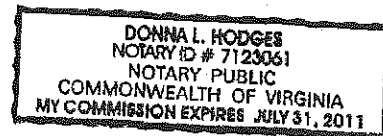
The foregoing instrument was acknowledged before me this 14th day of Sept by Jesse T. Wallace, Jr., City Manager, on behalf of the City of Hampton. He is personally known to me.

Donna L. Hodges
Notary Public

My commission expires:

Approved as to legal sufficiency:

Sally James Andrews
Sally James Andrews
Chief Deputy City Attorney



The terms and conditions of the Order are voluntarily accepted by:

Date: 9/12/07

By:

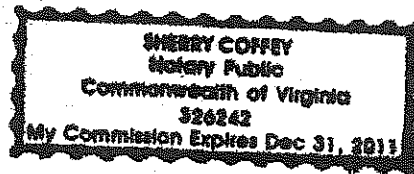
Charles Burgess
City Manager

Commonwealth of Virginia
City of Poquoson

The foregoing instrument was acknowledged before me this 12 day of September by Charles Burgess, City Manager, on behalf of the City of Poquoson.

Sherry Coffey
Notary Public

My commission expires: 12/31/2011



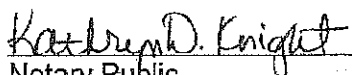
The terms and conditions of the Order are voluntarily accepted by:

Date: 9-17-07

By: 
City Manager

Commonwealth of Virginia
City of Newport News

The foregoing instrument was acknowledged before me this 17th day of Sept. ²⁰⁰⁷ by
Randy W. Hildebrandt, City Manager, on behalf of the City of Newport News.


Notary Public

My commission expires: 11/30/2008

Registration # 207439

The terms and conditions of the Order are voluntarily accepted by:

Date: 9/13/07

By:

[Signature]
City Manager

Commonwealth of Virginia
City of Portsmouth

The foregoing instrument was acknowledged before me this 13th day of Sept. 2007 by Kenneth L. Chandler, City Manager, on behalf of the City of Portsmouth.

Beverly W. Perrine
Notary Public

My commission expires: 8/31/2008 #216522

APPROVED AS TO FORM AND ACCEPTED ON BEHALF OF
THE CITY OF PORTSMOUTH, VIRGINIA

BY:

[Signature]

TITLE:

City Attorney

The terms and conditions of the Order are voluntarily accepted by:

Date: 9/19/07

By:

James M. Vardis
City Manager

Commonwealth of Virginia
City of Suffolk

The foregoing instrument was acknowledged before me this 19th day of September by
James G. Vardis, City Manager, on behalf of the City of Suffolk.

Hacey L. Sanford # 369502
Notary Public

My commission expires: October 31, 2009

The terms and conditions of the Order are voluntarily accepted by:

Date: 9/12/07

By: [Signature]
City Manager

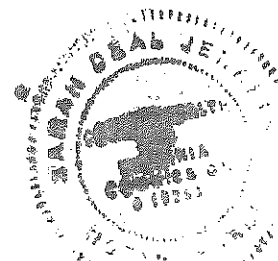
Commonwealth of Virginia
City of Virginia Beach

The foregoing instrument was acknowledged before me this 12th day of September by
[Signature] City Manager, on behalf of the City of Virginia Beach.

[Signature]
Notary Public

My commission expires:

August 31, 2009



The terms and conditions of the Order are voluntarily accepted by:

Date: 7/14/07

By: [Signature]
City Manager

Commonwealth of Virginia
City of Williamsburg

The foregoing instrument was acknowledged before me this 14th day of September by Jackson C. Tuttle, City Manager, on behalf of the City of Williamsburg.



My commission expires: 2/28/2010

[Signature]
Notary Public

The terms and conditions of the Order are voluntarily accepted by:

Date: 9/13/22

By: Win [Signature]
County Administrator

Commonwealth of Virginia
County of Gloucester

The foregoing instrument was acknowledged before me this 13 day of Sept ²⁰⁰⁷ by William H Whitley, County Administrator, on behalf of the County of Gloucester.

Dawn M Holgood
Notary Public

My commission expires:



The terms and conditions of the Order are voluntarily accepted by:

Date: September 20, 2007

By: W. Douglas Caskey
W. Douglas Caskey,
County Administrator

Attest:

Carey Mills Storm
Carey Mills Storm, Clerk

Approved as to form:

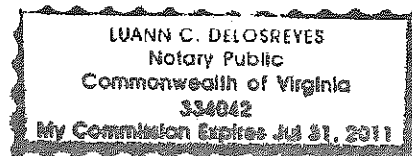
A. Paul Burton
A. Paul Burton, Interim County Attorney

Commonwealth of Virginia
County of Isle of Wight

The foregoing instrument was acknowledged before me this 20th day of September 2007
by W. Douglas Caskey, County Administrator, on behalf of the County of Isle of Wight.

Luann C. DeLosReyes
Notary Public

My Commission Expires: 07/31/2011



The terms and conditions of the Order are voluntarily accepted by:

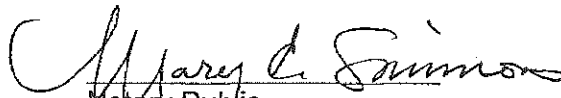
Date: 9-12-07

By: 

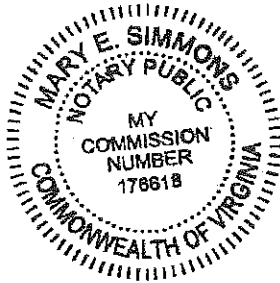
County Administrator

Commonwealth of Virginia
County of York

The foregoing instrument was acknowledged before me this 12th day of September by James D. McReynolds, County Administrator, on behalf of the County of York.


Notary Public

My commission expires: July 31, 2009



The terms and conditions of the Order are voluntarily accepted by:

Date: Sept. 13, 2007

By: Larry M. Foster
General Manager

Commonwealth of Virginia
James City Service Authority

The foregoing instrument was acknowledged before me this 13 day of Sept by
Larry M. Foster, General Manager, on behalf of the James City Service
Authority.

Melanie Davis
Notary Public

ID # 7014335

My commission expires: 12/31/10

The terms and conditions of the Order are voluntarily accepted by:

Date: 9/14/07

By:

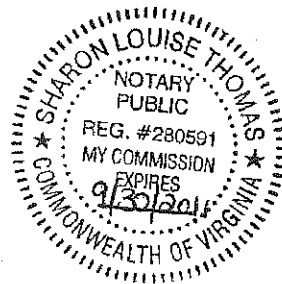
Peter M. Stephenson
Town Manager

Commonwealth of Virginia
Town of Smithfield

The foregoing instrument was acknowledged before me this 14th day of September 2007 by
Peter M. Stephenson, Town Manager, on behalf of the Town of Smithfield.

Sharon L. Thomas
Notary Public

My commission expires: 9/30/2011



APPENDIX A

HAMPTON ROADS SANITATION DISTRICT

HRSD shall perform the following:

1. Flow and Rainfall Monitoring and Reporting System
 - a. HRSD shall implement its plan for installation of flow meters, pressure meters and rainfall gauges, in accordance with the plan schedule, all as previously approved by DEQ's Tidewater Regional Office.
 - b. The available flow and rainfall data for the system shall be collected, analyzed and made available to the Hampton Roads Localities consistent with Attachment 1.
2. Integrated System Model. By the last day of the month that is 38 months after the effective date of this Order, develop and make available to the Hampton Roads Localities a regionally integrated, calibrated dynamic model describing the entire HRSD System, including rates and amounts of sewage delivered from the Hampton Roads Localities into the HRSD System. The model shall be developed in accordance with the Regional Technical Standards in Attachment 1 and submitted to DEQ for its review and concurrence. DEQ will be deemed to concur if it makes no objection within 90 days after the model is submitted. The model shall be based on actual flow rate and pressure data recorded by the meters required under paragraph 1 and input hydrographs to be provided by the Hampton Roads Localities.
3. SSES Plan. By the last day of the month that is 15 months after the effective date of this Order, complete and submit to the DEQ for approval, a plan and schedule for conducting an SSES of the HRSD System and assisting the Hampton Roads Localities in the performance of their individual SSESs. The Plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSESs shall be completed in accordance with the approved schedule.
4. Interim Repairs to Existing Facilities. While the work required by the foregoing paragraphs is underway during the term of this Order, identify and repair those interceptor system and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.

5. Interim System Improvements. Prior to implementation of the Regional Wet Weather Management Plan, any new or replacement interceptor system and treatment facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
6. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
7. Annual Reports. Submit annual reports to the DEQ on the status of the work required by Appendix A, with copies to the Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The reports shall be due on or before November 1 following the close of each fiscal year.
8. Management, Operations and Maintenance (MOM) Program. By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the HRSD sewer system and treatment plants and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

APPENDIX B

CITY OF CHESAPEAKE

The City of Chesapeake shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Chesapeake's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix B, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX C

CITY OF HAMPTON

- A. Pursuant to a Special Order by Consent, dated October 7, 2002 with the Board and HRSD, Hampton has completed a number of SSO-related tasks, including installation of flow meters and the collection of flow data at a number of pump stations; pipeline and manhole inspection, testing and repair; and inflow removal. In performing the tasks required by this Appendix, Hampton shall receive credit for and need not duplicate or otherwise perform the tasks completed pursuant to the October 7, 2002 Order.
- B. The City of Hampton shall perform the following:
1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSER of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSER Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSER shall be implemented in accordance with the approved schedule.
 2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
 3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
 4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
 5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with

HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.

6. Management, Operations and Maintenance (MOM) Program. By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Hampton's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.
7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix C, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX D

CITY OF NEWPORT NEWS

The City of Newport News shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Newport News's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix D, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX E

CITY OF POQUOSON

The City of Poquoson shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Poquoson's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix E, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX F

CITY OF PORTSMOUTH

The City of Portsmouth shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Portsmouth's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix F, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX G
CITY OF SUFFOLK

The City of Suffolk shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Suffolk's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix G, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX H

CITY OF VIRGINIA BEACH

The City of Virginia Beach shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Virginia Beach's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix H, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX I

CITY OF WILLIAMSBURG

The City of Williamsburg shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the City's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the City of Williamsburg's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix I, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX J

COUNTY OF GLOUCESTER

The County of Gloucester shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the County's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the County of Gloucester's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix J, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX K

COUNTY OF ISLE OF WIGHT

The County of Isle of Wight shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the County's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the County of Isle of Wight's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix K, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX L

COUNTY OF YORK

The County of York shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the County's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the County of York's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix L, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX M

JAMES CITY SERVICE AUTHORITY

The James City Service Authority shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the County's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the James City Service Authority's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix M, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

APPENDIX N

TOWN OF SMITHFIELD

The Town of Smithfield shall perform the following:

1. **SSES Plan.** By the last day of the month that is 15 months after the effective date of this order, complete and submit to the DEQ for approval, a plan for conducting an SSES of the Town's collection system. The plan shall conform to the Regional Technical Standards in Attachment 1. Provided that DEQ is involved in the development of the SSES Plan, upon receipt of a completed Plan, DEQ anticipates review and approval can be accomplished within 60 days. The approved plan shall become a requirement of this Order and the SSES shall be implemented in accordance with the approved schedule.
2. **Interim Repairs to Existing Facilities.** While the work required by paragraph 1 above is underway, identify and repair those sewer collection, force main and pumping station deficiencies that require prompt attention under the Regional Technical Standards in Attachment 1.
3. **Interim System Improvements.** Prior to implementation of the Regional Wet Weather Plan, any new or replacement collection system facilities will be designed and constructed in conformance with the Regional Technical Standards in Attachment 1.
4. **Cooperation with HRSD to Develop Regional Hydraulic Model.** Provide HRSD with sewer flow hydrographs for conditions of interest in accordance with the Regional Technical Standards in Attachment 1, pump curves and other information, and access to its facilities and property, as may be necessary for HRSD to install meters and gauges and perform its other obligations under Appendix A of this Order.
5. **System Hydraulic Model.** By the last day of the month that is 38 months after the effective date of this Order, develop a calibrated model of the Locality's sanitary sewer system necessary to be used in conjunction with HRSD's Integrated System Model. The model shall be developed in accordance with the guidelines in Attachment 1.
6. **Management, Operations and Maintenance (MOM) Program.** By the last day of the month that is 15 months after the effective date of this Order, submit to DEQ for approval a MOM program that documents the MOM program elements used to manage the Town of Smithfield's sewer system and minimize SSOs. The MOM program shall include an SSO Response Plan and tangible parameters for assessing program implementation.

7. SSO Reports. Promptly report all sewage discharges in accordance with the Hampton Roads Sanitary Sewer Overflow Reporting System, as approved by the DEQ, Tidewater Regional Office.
8. Annual Report. Submit annual reports to the DEQ on the status of the work required by Appendix N, with copies to HRSD and the other Hampton Roads Localities. The reports shall reflect work and activities undertaken during the previous fiscal year and shall include a summary of the system benefits achieved during the year. The report shall be due on or before November 1 following the close of each fiscal year.

**ATTACHMENT 1 TO THE SPECIAL ORDER BY CONSENT
REGIONAL TECHNICAL STANDARDS**

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ATTACHMENT 2 TO THE SPECIAL ORDER BY CONSENT MEMORANDUM OF AGREEMENT

EXHIBIT A – REGIONAL DESIGN GUIDELINES

EXHIBIT B – REGIONAL SANITARY SEWER SYSTEM OPERATING GUIDELINES

SECTION 1 INTRODUCTION AND PURPOSE

1.1 INTRODUCTION

This document is Attachment 1 – Regional Technical Standards (Standards) to the Special Order by Consent (Consent Order) issued by the State Water Control Board (SWCB) to HRSD and the Hampton Roads Localities. These Regional Technical Standards provide detailed requirements for completion of the work embodied in the Consent Order, and were developed to ensure a consistent regional approach. These Standards include completion dates for various activities, which are described in terms of months from the effective date of the Consent Order.

1.2 PURPOSE

The purpose of the Consent Order and these Regional Technical Standards is to reduce the occurrence of sanitary sewer overflows (SSOs) in the Regional Sanitary Sewer System. These standards cover the analysis of existing data, collection of additional system data, preparation of rehabilitation plans, correction of serious defects requiring prompt attention, development of a hydraulic model, and assessment of the hydraulic performance of the Regional Sanitary Sewer System. These Standards have been developed to be information-based so that resources are focused on the areas that require attention to mitigate SSOs. Where appropriate, these Standards include quality assurance/quality control procedures related to field data collection.

These Standards also address the relationship between the hydraulic performance of the Regional Sanitary Sewer System, Rehabilitation Plans that will be developed and implemented by HRSD and the Hampton Roads Localities, and the Regional Wet Weather Management Plan. The longer-term repairs of the sanitary sewer system will occur after the term of this Consent Order in accordance with plans developed, submitted and approved pursuant to this Consent Order.

1.3 RELATIONSHIP WITH THE MEMORANDUM OF AGREEMENT

The Localities and HRSD are entering into a Memorandum of Agreement (MOA) which is a long term agreement related to regional collaboration. These Regional Technical Standards have been developed primarily to support the fulfillment of the Consent Order requirements, and are incorporated into the MOA by reference. Future work done outside the context of the Consent Order, and future regulatory actions, should generally be conducted in accordance with these standards when it is appropriate. For example, future flow monitoring performed outside the context of the Consent Order and future regulatory actions would generally be performed in accordance with these standards, but

the duration and magnitude of qualifying events could be different from the standards in this document. Similarly, SSES and hydraulic modeling conducted for purposes unrelated to the Consent Order should follow these Standards, with appropriate modifications to reflect the specific application.

Two components of these Standards will survive the fulfillment of the Consent Order and are enforceable under the MOA. These are Exhibit A – Regional Design Guidelines and Exhibit B – Regional Sanitary Sewer System Operating Guidelines.

1.4 SUMMARY OF THE REGIONAL TECHNICAL STANDARDS

The following is a brief overview of each section of these Regional Technical Standards:

Section 1 – Introduction and Purpose

This section establishes the context for the Regional Technical Standards.

Section 2 – Definition of Terms

This section provides definitions for the major terms used in the Standards.

Section 3 – Data Collection and Flow Monitoring

This section provides direction on SSO characterization, use of previously developed information, system inventory mapping and GIS data standards, flow monitoring procedures for both model calibration and SSES basin identification, rainfall monitoring, sewer flow evaluation and flow evaluation reporting. Taken together, this section provides the guidance for identification of SSES Basins, which require further investigation.

Section 4 – Condition Assessment of Sewers and Pump Stations

This section provides the guidelines for conducting detailed condition assessment, assessment standards for SSES Basins, and assessment reporting requirements. The information developed through these efforts will be used to develop the SSES Plans in accordance with the requirements in Section 5.

Section 5 – SSES Planning

This section establishes the SSES Basin criteria and the requirements for preparing a prioritized plan for conducting the SSES work. This plan must be submitted to DEQ within 15 months of the effective date of the Consent Order for their review and approval.

Section 6 – Hydraulic Performance Assessment

This section provides the standards for development and application of a hydraulic model that will be used to evaluate system performance under a variety of hydrologic conditions. The model will be used to evaluate the capacity of the existing Regional

Sanitary Sewer System, and to develop and review alternatives for providing adequate capacity. Procedures and standards for model development, calibration and verification are included. The model shall be developed within 38 months of the effective date of the Consent Order.

Section 7 – Rehabilitation Planning

This section discusses using the results of the SSES work to develop specific plans for rehabilitation, including evaluation of the effectiveness of rehabilitation on inflow and infiltration reduction, cost estimates and schedules. The Rehabilitation Plans will be submitted to DEQ for review and approval within 62 months of the effective date of the Consent Order. Implementation of the plans is outside the scope of the current Consent Order. Localities will assess the feasibility and cost of achieving specific peak flow reduction outcomes, which will inform the Regional Wet Weather Management Plan.

Section 8 – Regional Wet Weather Management Plan Development

This section provides the guidelines for developing the Regional Wet Weather Management Plan (RWWMP) that will identify the Regional Sanitary Sewer System improvements necessary to provide capacity to meet an agreed upon level of service. This section includes direction on capacity assessment, level of service selection, development of capacity enhancement solutions, affordability and provides a preliminary outline for the content of the RWWMP. The Regional Wet Weather Management Plan will be submitted to DEQ for review and approval within 74 months of the effective date of the Consent Order.

Exhibit A – Regional Design Guidelines

This section presents regional design guidelines that will be used for design of any new or enhanced major sewer infrastructure until the RWWMP is complete.

Exhibit B – Regional Sanitary Sewer System Operating Guidelines

This section provides guidelines related to operating flow and pressure in the Regional Sanitary Sewer System.

1.5 REVISIONS TO THE REGIONAL TECHNICAL STANDARDS

The parties agree that minor changes may be made in the Standards without triggering a modification of the Order, provided that such changes are the subject of unanimous agreement of the General Manager of HRSD and the Hampton Roads Localities Directors of Utilities and are approved by the Director of DEQ's Tidewater Regional Office.

2 DEFINITION OF TERMS

The following words and terms that have been used in Attachment 1 – Regional Technical Standards shall have the meanings assigned to them below unless the context clearly indicates otherwise. Other commonly used terms used in Attachment 1 are defined by reference to terms in the Sewage Collection and Treatment Regulations (SCATR) [9VAC 25-790] unless otherwise specifically defined in these Regional Technical Standards.

“ADF” means Average Daily Flow.

“Adequate Capacity” means that the Sanitary Sewer System has a demonstrated ability to manage peak flows at a specific peak flow recurrence interval without causing or contributing to overflows from any component of the Regional Sanitary Sewer System. The specific peak flow recurrence that will be used for the basis of identifying capacity enhancements shall be established within the Regional Wet Weather Management Plan.

Demonstration of adequate capacity for wastewater pumping stations requires each pump station to be capable of transmitting specific peak flows with the largest pump out of service, without causing or contributing to overflows. Evaluation of adequate capacity shall consider the interrelationship between: i) each pump and the pump station immediately upstream from that pump station, ii) all pump stations through which flow from that pump station passes to the wastewater treatment plant receiving such flow, and iii) all pump stations discharging directly to the HRSD Sanitary Sewer System, which receive flow from that pump station.

For gravity systems, adequate capacity shall mean that the system can convey the peak flow without exceeding a surcharge level of 1.5 feet below the rim of a manhole.

“ASCII” means American Standard Code for Information Interchange.

“CCTV” means closed-circuit television.

“CMMS” means computerized maintenance and management system.

“DEQ” means the Department of Environmental Quality, an agency of the Commonwealth of Virginia as described in Code § 10.1-1183.

“Design Flow Rate” means the flow rate specifically used as the basis of design for facilities within the regional sanitary sewer system.

“Diurnal curve” means a graphical or tabular representation of the variation of wastewater flow (excluding rainfall derived I/I contributions) over a typical, 24-hour cycle.

“DWI” means dry weather infiltration.

“Dry Weather Overflow” means any sanitary sewer overflow for which the underlying cause is not attributable to precipitation related flows.

“Event of Interest” means any wastewater flow event or specific rainfall event, which is used to evaluate the performance of the sanitary sewer system.

“Excessive Pump Run Time” means a threshold at which a pumping station meets the relevant SSES Basin planning criterion. Excessive Pump Run Time can be identified by evaluating the daily total run time of all pumps within a pump station under wet weather/peak flow conditions. Excessive Pump Run Time exists when the total run time for all pumps within a pump station exceeds an average of 24 hours per day per pump with one pump out of service. This threshold can be calculated using the following equation,:

$$\text{Excessive Pump Run Time} = [(\text{Number of Pumps}) - 1] \times 24 \text{ hours}$$

Excessive pump run time is a threshold that must be compared to actual pump run time under specific flow conditions to identify indications of potential capacity limitations. Excessive pump run time and actual pump runtime should be directly compared for pump stations that are comprised of constant speed pumps of equal size, or multi-speed pumps that are running at full speed.

“GIS” means Geographic Information System.

“Gravity Sewer Line” means a pipe that receives, contains and conveys wastewater not normally under pressure, but is intended to flow under the influence of gravity.

“Ground Water” means sub-surface water that is stored in the voids between soil particles.

“Hampton Roads Localities” means the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the counties of Gloucester, Isle of Wight, James City, and York; and the town of Smithfield.

“Hampton Roads Locality” or **“Locality”** means one of the Hampton Roads Localities.

HRPDC means Hampton Roads Planning District Commission, a political subdivision of the state. The purpose of planning district commissions, as set out in the Code of Virginia, Section 15.2-4207 is "...to encourage and facilitate local government cooperation and state-local cooperation in addressing on a regional basis problems of greater than local significance".

HRSD means Hampton Roads Sanitation District, a political subdivision created by a 1940 Act of the General Assembly of Virginia and charged with the responsibility to provide sewage collection, conveyance, and treatment services for the communities in the Hampton Roads metropolitan area.

HRSD Master Meter means a permanent flow or pressure meter installed in a location mutually agreed upon between HRSD and the Hampton Roads Localities, owned and operated by HRSD, and specified within the HRSD Master Metering Program. HRSD Master Meters are used to evaluating Operating Flow.

Hydrograph means the graphical or tabular representation of flow volume over time, which could depict a specific hydrologic condition.

I/I means infiltration and inflow, which is a component of sewer flow contributed as a result of groundwater and precipitation that enters the sanitary sewer system.

Illicit Connection means an unauthorized connection to the sanitary sewer system, including but not limited to area drains, foundation drains, roof drains and sump pumps. Illicit connections are connections that have been made to the sanitary sewer system without the knowledge and/or approval of the Locality or HRSD.

IMS means information management system, which is a formalized system to manage data.

Infiltration means water other than wastewater that enters a sewer system (including sewer service connections) from the ground through such means as defective pipes, pipe joints, connections, or manhole walls. Infiltration does not include, and is distinguished from, inflow.

Inflow means water other than wastewater that enters a sewer system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cleanouts, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage. Inflow does not include, and is distinguished from, infiltration.

“Interceptor Sewer” means a sewer, typically without individual sewer customer connections, that is used to collect and carry flows from main and trunk sewers to a central point for treatment and discharge.

“LACP” means Lateral Assessment Certification Program developed by National Association of Sewer Service Companies.

“Level of Service” means the peak sewer flow recurrence interval that the Regional Sanitary Sewer System can convey without resulting in a capacity-related SSO.

“MACP” means Manhole Assessment Certification Program developed by the National Association of Sewer Service Companies.

“Management, Operations, and Maintenance or MOM” means a flexible program of accepted industry practices to properly manage, operate and maintain a sanitary sewer system.

“NASSCO” means National Association of Sewer Service Companies.

“ODBC” means Open Database Connectivity.

“Operating Flow” means three times the actual average potable water consumption for domestic flow and smaller commercial flow within a specific sewer basin (or pump station service area). Major industrial and commercial wastewater flows (100,000 gpd and greater) are added to the Operating Flow based on their peak metered flow rates. When the peak hourly flow rate as measured at HRSD Master Metering sites exceeds the corresponding Operating Flow, HRSD and the effected Localities will jointly evaluate the hydraulic capacity of the impacted facilities and determine the appropriate course of action.

“PACP” means Pipeline Assessment Certification Program developed by NASSCO.

“Peak Flow” means the maximum hourly wastewater flow that occurs at a specific location within the sanitary sewer system.

“Peak Flow Recurrence” means the statistical probability of achieving a certain peak sewer flow. Typically, these values are expressed in terms of return years, or return frequency. As an example, a 10-year peak flow recurrence represents the probable peak sewer flow that is expected to occur once every 10 years.

“Peak Flow Threshold” means the calculated flow of 775 gallons per day per existing residential unit plus 3 times commercial water consumption plus actual major commercial and industrial (100,000 gpd and greater) flows.

"Preventable Overflow" or "Preventable SSO" means overflows, which could have reasonably been prevented through due diligence, proper operations and maintenance, reduction in I/I, or increased capacity of the sanitary sewer system.

"Private Service Connection/Lateral" means that portion of the collection system used to convey wastewater from a building or buildings to that portion of the sanitary sewer system owned by the Locality.

"Pumping Station" means facilities comprised of pumps which lift wastewater to a point physically higher than the wastewater elevation in the wet well, including all related electrical, mechanical, and structural systems necessary to the operation of that pumping station.

"RDII" means rainfall-derived inflow and infiltration. RDII is a parameter that can be measured, estimated or synthetically generated through other means, such as flow monitoring data or hydraulic modeling.

"Regional Design Guidelines" means the standards adopted by HRSD, the Hampton Roads Localities and DEQ for the design of any new or enhanced major sewer infrastructure (i.e., regional pump stations, major interceptors, etc.) until the Regional Wet Weather Management Plan is complete. The adopted Regional Design Standards will be based on a peak hourly residential wastewater flow of 250 gallons per capita per day at an assumed 3.1 persons per household, or 775 gallons per residential unit per day; plus peak hourly commercial/industrial wastewater flow based on actual flow if available, or 3 times the average projected water consumption if not available. The relationship of peak water consumption to peak wastewater flow is assumed to be 3 times the water consumption is equal to 2.5 times wastewater flow.

"Regional Hydraulic Model" means the hydraulic model of the following components of the regional sanitary sewer system:

- All HRSD pipes, HRSD pumping stations, and HRSD pressure reducing stations, in the regional sanitary sewer system
- Locality pumping stations that directly discharge into a HRSD interceptor sewer
- The gravity sewers extending one manhole upstream from each Locality pumping station that directly discharges to a HRSD interceptor sewer (Note that some pumping stations may receive discharge from multiple sewers; in these instances, the first upstream manhole on each line will be included).
- Locality gravity sewers extending one manhole upstream from the point of connection with an HRSD gravity interceptor.

"Regional Sanitary Sewer System" means the collective sanitary sewer systems owned and operated by the Localities, as well as the HRSD sanitary sewer system including

gravity sewer lines, manholes, pump stations, lift stations, pressure reducing stations, force mains, wastewater treatment plants, and all associated appurtenances.

“Regional Wet Weather Management Plan (RWWMP)” means the document to be developed jointly by HRSD and the Hampton Roads Localities that defines prioritized capital and operating improvements in the Regional Sanitary Sewer System necessary to manage peak wet weather flows to achieve a mutually agreed upon level of service.

“Rehabilitation Plan” means documents to be developed individually by each Hampton Roads Locality and HRSD that define specific measures to reduce SSOs, address deficiencies identified in SSES Basins; identify system-wide improvements including control of I/I sources and improvements needed to ensure sustainability of the sanitary sewer infrastructure.

“Replacement” means obtaining and installing equipment, accessories, or appurtenances which are necessary at the end of the design or useful life, whichever is longer, of the sanitary sewer system to maintain the capacity and performance for which such works were designed and constructed.

“Rainfall Recurrence Interval” means the statistical probability of achieving a rainfall of specific intensity, volume and duration. Typically, these values are expressed in terms of return years. As an example, a rainfall with a 2-year recurrence interval has a probability of occurring once every two years.

“Sanitary Sewer Overflow (SSO)” means the unauthorized intentional or unintentional spill, release, or discharge to waters of the State of untreated wastewater from any portion of a sanitary sewer system before the headworks of a Wastewater Treatment Facility.

“Sanitary Sewer System” means the wastewater collection and transmission system that is comprised of all portions of the individual Hampton Roads Locality or HRSD collection systems, including manholes, gravity sewers and force mains, lift stations, pump stations, and associated appurtenances. Building sewer laterals are not considered part of the Locality’s sanitary sewer system.

“Sewer Basin” means all portions of the sanitary sewer system tributary to an interceptor sewer or pump station (also referred to as a pump station service area). Generally, the sewers within a Sewer Basin are hydraulically linked.

“Sewer Basin Criticality” means an expression of the condition of a sewer basin as it relates to consequences of failures within the associated sanitary sewer system. Sewer Basin criticality may consider factors such as environmental risk, public health risk (including potential impacts to drinking water sources from SSOs), economic risk (including potential impacts on new service connections due to sanitary sewer system capacity limitations), and operational risk.

“Sewer System Evaluation Survey (SSES)” means a systematic examination of a sanitary sewer system or portion thereof to, at a minimum: i) identify the condition of sewers, manholes, pump stations and associated appurtenances; ii) identify I/I sources, locations, and associated extraneous flow rates; iii) characterize the wastewater flow; and iv) determine technically feasible, cost effective methods of rehabilitation.

“Significant Rainfall Event” means a rainfall event, which results in an associated measurable increase of wastewater flow in the sanitary sewer system above dry weather flows. Significant rainfall events are defined solely for the purposes of flow monitoring data analysis.

“SSES Basin” means a defined portion of the sanitary sewer system where historical data and/or flow monitoring data collected pursuant to this Attachment indicate high levels of RDII, unresolved SSOs, or other characteristics described in Section 5.1 that warrant investigation. SSES Basins will be subject to investigation to identify infrastructure deficiencies and define the potential for peak flow reduction.

“Supervisory Control and Data Acquisition (SCADA)” means a computer system for gathering and analyzing real time data.

“Surcharge” means the condition where gravity sewer flow depth exceeds the diameter of the sewer line that is conveying the flow.

“TAZ” means Traffic Analysis Zone. Demographic data for each TAZ is maintained by HRPDC in a GIS database, and includes population and workforce data used to predict growth and future flows for modeling purposes.

“Unpermitted Discharge” means the discharge of pollutants from a point source into waters of the State, which is not authorized by a VPDES Permit, including but not limited to any SSO, which reaches waters of the Commonwealth.

“Unresolved SSO” means any SSO for which the underlying cause has not been resolved so as to prevent future reoccurrences at that location from that cause.

“Useful Life” means the length of time, or period during which infrastructure assets operate. Useful life is not synonymous with “design life” which is the period over which infrastructure assets are planned to be used and designed to be operated.

“Water Consumption” means the volume of potable water consumed by residential, commercial, and industrial users as measured by potable water meters.

SECTION 3 DATA COLLECTION AND FLOW MONITORING

3.1 REVIEW OF EXISTING INFORMATION

Development of the SSES program components requires sound system knowledge. Existing sewer system information shall be compiled and evaluated to establish the basis for identifying additional data needs.

Information sources shall include the following, as available and appropriate for the specific system:

- Sewer system maps
- Engineering and design studies, including hydraulic analyses
- SSES studies
- Any existing system condition/inspection data
- Maintenance staff interviews
- Operation and maintenance records
- Treatment plant flow and operation records
- Pumping station flow records and SCADA data
- Sanitary Sewer Overflow (SSO) reports
- Customer complaint records
- Existing Asset Condition Data (e.g., CCTV records)

A suitable data acquisition plan shall be developed and implemented to address data gaps and information needs.

3.1.1 Sanitary Sewer Overflow Characterization

The cause, location, estimated quantity and frequency of all sanitary sewer overflows (SSOs) that have occurred during the past five (5) years, if available, shall be analyzed to determine where there may be unresolved maintenance, structural, and capacity issues. SSOs may be classified according to the following causes (or a similar classification system):

- Maintenance
 - Grease
 - Roots
 - Debris (including sediment accumulation)
- Infrastructure
 - Pipe Failure/Defects
 - Equipment Failure
- Capacity
 - Excessive I/I

- Unanticipated Wastewater Flows
 - Pressure Problems
 - Reverse Grade
 - Hydraulic Bottlenecks
 - Inadequately Sized Facilities
- Damage by Others
 - Vandalism
 - Contractor Damage
 - Illegal Discharges
- Power Outages
 - Response Times

SSO evaluation shall be conducted to identify chronic problems and develop appropriate mitigation actions for each SSO. The SSO locations shall be identified on a sanitary sewer system map, preferably in GIS, and coded by cause. This action will facilitate the SSO analysis.

3.1.2 Prior Studies/Planned Construction

Studies that have been completed within five (5) years of the execution date of the Special Order by Consent may be considered valid, and the area may be excluded from further SSES work under the Special Order by Consent, provided that the work included in the study substantially meets requirements of the Regional Technical Standards established herein. Studies older than 5 years may be used to develop the SSES Plan provided that any changes that have occurred in the sanitary sewer system that may impact the results of the study are understood and considered in the use of the data. The areas addressed within prior studies will be identified within the SSES Plan described in Section 5.

Areas of the system that have been rehabilitated within five years prior to the execution date of the Special Order by Consent will be excluded from further SSES work under these guidelines, provided they do not meet the criteria contained in Section 5.1.

Areas covered by prior studies that will be included in the Rehabilitation Plan under the Special Order by Consent will not be reevaluated, except at the discretion of the Locality or HRSD for their respective rehabilitation plans.

Areas that are, or will be, scheduled for rehabilitation prior to submittal of the Rehabilitation Plan described in Section 7 will be excluded from further SSES work, provided that the rehabilitation project is consistent with Attachment 1 – Regional Technical Standards, as appropriate. Rehabilitation projects that have been initiated prior to execution of the Special Order by Consent and have advanced beyond the Preliminary Engineering Report stage will not be impacted by the provisions of the Special Order by Consent.

3.1.3 Engineering and Operations

Sewer system engineering and operational information that is useful in SSES Planning includes:

- Mapping of the project area showing sanitary sewer systems, streets and roads, contours and spot elevations, and storm sewers and appurtenances
- Design drawings, pump curves, design reports, and operating data (pump run time logs)
- SCADA information to include system pressure, metered flow, pump run times, wet well levels, and alarm and event data
- Information on work order history and maintenance records for sewer facilities
- Historical water consumption data
- Rainfall gauge data
- Groundwater monitoring data where deemed necessary by the Locality

These data shall be used, where available, to identify problem areas within the sanitary sewer system that result from connectivity issues, design limitations, or maintenance issues. These data may also be used to help define the activities needed to further investigate and/or collect additional information about the system.

3.1.4 Other Performance Documentation

Known ongoing operational and/or maintenance problems shall be reviewed prior to the initiation of the field investigations. This information will be obtained through consultation with the Locality's and HRSD's staff. The list below is representative of the types of issues that shall be investigated:

1. Based on the experience of the staff, where are the significant problem areas in the sanitary sewer system?
2. Have there been any significant recent changes in the patterns or type of sewer problems (overflows, stoppages, collapses, etc.) from those identified in prior investigations or other prior studies?
3. Have there been repairs conducted that were identified in prior investigations?
4. Which sewer lines within the study area are currently on a routine cleaning program, and do they correlate with past problem areas?
5. Can reported problems such as grit, grease, roots or inflow be substantiated through a preliminary inspection of critical manholes or sewer segments?

6. Are there any easement or right-of-way issues affecting the access, such as backyard locations?
7. What are the local issues regarding traffic control, site accessibility, and maintenance activities?
8. Is the force main manifolded with another pumping station or an HRSD pumping station? If so, are there discharge pressure issues?
9. Under what conditions and how long does the pumping station require all pumps to operate?
10. Does unacceptable surcharging occur in the system? If so, where and under what conditions does this surcharging occur?
11. Have there been construction activities by others within the sanitary sewer system service area where trenchless techniques have been used that may have damaged pipes?

3.2 SYSTEM INVENTORY

An inventory of the sewer system's components shall be prepared so that those components can be consistently referenced during the SSES and subsequent analyses. The inventory shall include:

- Gravity mains
- Laterals
- Manholes
- Pump stations
- Force mains
- Vacuum systems
- Appurtenances (i.e., valves, clean outs, siphons)

3.2.1 Mapping Standards

The mapping shall be developed using the Virginia State Plane Coordinate System with a known vertical control that can be easily transferred to other standard vertical datum.

3.2.2 GIS Data Standards

To compile a GIS dataset for the regional sanitary sewer system, the following major datasets are needed:

- Regional GIS base mapping from HRSD
- Available supplemental GIS base mapping data from each locality
- Existing sanitary sewer system GIS data from each locality
- Existing hard copy or other electronic format of sanitary sewer system maps for localities where GIS data is not available

Sewer system GIS data shall include gravity pipes, manholes, pump stations, force mains, valves, pressure reducing stations and other pertinent facilities. The GIS data shall be transferable to HRSD for hydraulic model development. The GIS data formatting shall be agreed upon between the Locality and HRSD prior to data collection activities associated with the Special Order by Consent. HRSD shall provide each Locality with a data-mapping scheme for the transfer of GIS data. The Locality shall provide the necessary data to HRSD in the agreed upon format. All GIS data shall have metadata associated with each data set.

3.2.3 Existing Physical Attribution

Physical attribution is needed to describe the various facilities within the system. At a minimum, the following attributions shall be included for each feature used in modeling:

Pipe:

- feature ID
- upstream and downstream manholes or junctions
- pipe size (inside diameter)
- length
- gravity line invert elevations (upstream and downstream)
- pipe material
- approximate pipe installation date / age
- pipe condition
- pipe type, i.e., force main or gravity sewer

Manholes:

- manhole ID
- diameter/size
- spatial coordinates
- invert elevation
- pipe invert elevations
- rim elevation
- ground elevation

- sealed or unsealed lid
- sump elevation
- approximate manhole installation date / age

Pumping Stations:

- pump station ID
- wet-well physical attributes (i.e. dimensions)
- pumping capacity (i.e. pump performance curves, draw down test results)
- number of pumps
- type of drive (i.e. variable speed, dual speed, or constant speed)
- control logic (i.e., wet well elevations at which each pump turns on, reaches full speed, and turns off)
- piping details
- flow equalization/storage attributes and control strategy
- special equipment (e.g. pressure regulating valves)
- flood plain location
- approximate pump/pump station installation date / age

Where the data is not available, assumptions must be made to complete the data set based on engineering judgment.

3.3 FLOW MONITORING PROGRAM

Flow monitoring shall be conducted to characterize the flow regime in the sanitary sewer system. The objectives of the flow-monitoring program are as follows:

- Collect representative dry and wet weather flow data for the sewer basin(s)
- Identify conditions that cause sewer surcharging
- Observe and quantify dry weather infiltration
- Quantify rainfall derived inflow and infiltration (RDII) volumes
- Correlate RDII with rainfall volumes and intensities
- Determine and assist in prioritizing SSES Basins
- Obtain data necessary for hydraulic model calibration
- Facilitate development of the Regional Wet Weather Management Plan
- Observe and quantify potential dry-weather inflow (e.g. manholes located in low-lying areas which may be inundated in dry-weather by tidal effects or stream flow)

The scope of the flow-monitoring program shall be developed to ensure data collection is adequate to meet the program objectives. Flow data that has been collected five (5) years prior to execution of the Special Order by Consent, which meets the requirements

established within these Technical Standards, may be used. Before defining the scope, the Locality shall determine:

- The adequacy of existing data from prior studies (e.g., study areas in which no significant changes have occurred since the flow monitoring took place)
- Extent that pump station data can be used to quantify flows
- Equipment types and availability
- Where flow monitoring is needed
- Types of flow to be monitored
- Cost to collect and evaluate the data
- The seasonal variations of flow within the sanitary sewer system, if significant

3.3.1 Meter Site Selection and Basin Delineation

Selection of meter location sites is critical to defining sewer basins. Flow meter sites shall be selected so that the entire flow for the area of interest can be characterized. This may require multiple meters for areas with parallel sewers or complex connectivity. Metering sites should also be considered at boundary points for calibration and validation of hydraulic model(s). Meter sites shall be compatible with the minimum requirement of the flow monitoring equipment manufacturer relative to physical site constraints.

Sewer basin delineation can be accomplished through use of sewer mapping. It is important that the meter locations are strategically selected to provide an appropriate delineation of sanitary sewer system basins.

3.3.2 Acceptable Flow Measures and Recording

Equipment may consist of one or more of the following: open channel flow monitors, SCADA data (pump run times, discharge pressure and volumetric data) capable of computing flow, or monitoring flow in force mains. Flow monitoring equipment shall include a data logger, communication device and sensing unit. Where pressure pipe flow monitoring is to be performed for pump discharge flow measurements, magnetic flow meters or ultrasonic meters should be used. Where flow is measured in force mains, pressure shall also be measured. All gravity sewer metering equipment shall be capable of recording in both low flow and surcharged conditions for wet weather monitoring. The Locality and HRSD must utilize engineering judgment in the selection of flow monitoring methods and the application of the resulting data.

Strengths and limitations for each flow monitoring method shall be evaluated considering characteristics of the flow to be measured and the location to be monitored. Note that the pump station volumetric method of determining flow rate is not reliable for conditions where wet well levels surcharge into the incoming sewer lines, or where variable

frequency drive units are in place, unless other metering is used to account for flows being discharged from or entering the pump station. Pump curves and system curves shall be verified when using this methodology to estimate flow rates. Caution should be exercised in application of this methodology. It is most appropriate for pump or lift stations with constant speed pumps that discharge to gravity sewers.

3.3.3 Duration of Flow Monitoring

For the purposes of model calibration and identifying areas for SSES activities, temporary flow measurement shall be conducted. The flow data shall capture a representative sample of dry weather flows as well as several storm events of varying magnitudes. Temporary flow monitoring shall be conducted for a duration that satisfies the following minimum criteria:

Flow Monitoring for Model Calibration and Verification:

- Flow monitoring shall provide data that characterizes seasonal variations and captures the peak seasonal sanitary sewer flows.
- Flow monitoring shall record three (3) individual wet-weather flow events of greater than one (1) inch of accumulation, including at least one (1) event with at least a one-year recurrence interval. These events shall capture system response under a variety of antecedent rainfall and groundwater conditions.
- Flow monitoring shall continue for sufficient time between rain events for the flow to return to dry weather conditions.

Flow Monitoring for SSES Basin Identification:

- Flow monitoring period shall be of sufficient length to capture typical diurnal variations in dry-weather flow, including weekends and weekdays.
- Flow monitoring that captures three individual wet-weather events each of which provide a system flow response, including a rainfall event representative of those with a one year rainfall recurrence interval, or at least six months if the one year recurrence interval is not achieved provided that there is at least one event where the total 24 hour rainfall exceeds 1.5 inches.
- Flow monitoring shall be conducted during a period that provides the highest probability of wet conditions.

Flow monitoring for SSES Basin identification shall be completed within 12 months of the effective date of the Order. Notification that flow monitoring for SSES Basin identification has been completed shall be submitted to DEQ within 13 months of the effective date of the Order.

Flow monitoring for SSES Basin identification and hydraulic model calibration shall be conducted at a minimum of 20 percent of the pump station service areas within the

Locality's sanitary sewer system. Selection of locations for flow monitoring shall include pump stations that are representative of a group of pump stations that exhibit similar responses to the variables, which impact peak flow. Examples of the variables that shall be considered include, but are not limited to: the average age of the gravity sewers in the sewer basin; pipe material and joint type; soil-type and porosity; maximum, minimum and yearly groundwater elevations; proximity to surface water bodies; tidal influence; ratio of pervious to non-pervious surface area; service areas size; land use; historic I/I data; seasonal population patterns; and sanitary sewer system construction materials.

Additional flow monitoring beyond the 20 percent shall be conducted as necessary to accurately characterize flows for either SSES Basin identification and/or hydraulic model calibration.

Flow monitoring data shall be reviewed for conformance with the criteria for model calibration and verification, as well as SSES Basin identification. If the review of the monitoring data indicates the criteria have been satisfied temporary metering can be discontinued. Otherwise flow monitoring shall continue until adequate data are obtained.

Individual utilities may require additional flow monitoring data for model verification. Verification of a hydraulic model involves comparing flow-monitoring data outside of the data set used for calibration to the predicted results of the model for the same conditions. The verification process may identify inaccuracies in the model not identified during calibration phase. Data requirements for verification shall include wet-weather events not used for calibration.

3.3.4 Data Accuracy Specifications

Flow monitoring accuracies will be based on typical accuracies for the type of equipment used. Flow meters shall monitor flow between sample periods and provide maximum and minimum values at 15-minute intervals. Additionally, flow meters shall be capable of collecting and reporting data at five (5) minute intervals when the percent change in flow is greater than ten percent (10%) in any fifteen (15) minute interval.

Prior to installation of any meter and/or gauge, the device shall be calibrated according to manufacturer's recommendations. The calibration of open channel flow meters will be checked periodically after installation using supplemental velocity and/or level measurement devices, where the use of such devices is practical. Calibration records shall be included in the flow evaluation report to demonstrate that the equipment was properly calibrated. Any recalibration required during the monitoring period shall be noted and also included in the report. The meters should be maintained in a manner that shall provide for a minimum:

- Seventy-five percent (75%) data reliability for each individual meter during a monthly monitoring period

- Ninety percent (90%) for all meter data should be maintained during qualifying rain events described in Section 3.3.3

Data reliability means the percentage of flow data that has been collected and is not obviously incorrect (i.e., flat lines or drifted from known calibration levels).

Rainfall, flow and pressure monitoring shall be carried out in accordance with current standard practices, and shall generally be in conformance with widely used industry guidance such as WRC's "A Guide to Short Term Flow Surveys of Sewer Systems", WEF's MOP FD-6 *"Existing Sewer Evaluation and Rehabilitation"*, and NASSCO's *"Manual of Practices"*.

3.3.5 Rainfall Monitoring

Rainfall monitoring shall be done to obtain the data needed to compare wet weather sewer flow to rainfall volume, duration and intensity. The relationship between peak sewer flow and rainfall shall be used during the evaluation of the sewer system's performance and the prediction of rainfall derived inflow/infiltration (RDII). Rainfall gauges shall be of the continuous recording type, and store data in 15-minute increments. Rain gauges shall be distributed throughout the area covered by the sanitary sewer system on a minimum of every 10 square miles. The placement of rain gauges shall be coordinated between HRSD and the Localities. Localities with a total area covered by the sanitary sewer system of less than 10 square miles shall install at least one rain gauge. That density should provide reasonable coverage and representation of variations in rainfall intensity, duration and accumulation throughout the sewer system. Rainfall gauges shall be capable of recording rainfall at 0.1-inch intervals or less.

Rain data can be supplemented by data from gauges maintained by United States Geologic Survey (USGS) and/or the National Oceanic and Atmospheric Administration (NOAA). Rain gauge data may also be supplemented by radar rainfall records derived from radar information that is calibrated with rain gauges maintained by the USGS, NOAA, and the Localities.

3.3.6 Ground Water Monitoring

Ground water level data shall be used, where available, to establish the potential for ground water infiltration into the sewer system. Groundwater data can be used in conjunction with flow data to analyze infiltration based on the relationship between the groundwater table level and the elevation of the sewers.

3.3.7 Flow Monitoring Plan

A Flow Monitoring Plan shall be developed and submitted to DEQ for review and concurrence within 3 months of the effective date of the Order. DEQ will be deemed to concur if it makes no objection within 30 days of Flow Monitoring Plan submittal. The Flow Monitoring Plan shall include the following minimum information:

TITLE PAGE

- Project/Report Title
- Locality Contact Information

EXECUTIVE SUMMARY

EVALUATION OF EXISTING FLOW DATA FOR COMPLIANCE WITH REGIONAL TECHNICAL STANDARDS

- SCADA Derived Flow Data
- Sanitary Sewer Evaluation Studies
- Flow Surveys

ASSESSMENT OF FLOW DATA REQUIREMENTS FOR SANITARY SEWER HYDROGRAPH GENERATION/MODELING REQUIREMENTS

ASSESSMENT OF FLOW DATA REQUIREMENTS FOR SSES BASIN IDENTIFICATION

IDENTIFICATION OF BASINS/SERVICE AREAS REQUIRING ADDITIONAL FLOW DATA

FLOW MONITORING SITE SELECTION

- Site Selection Criteria
- Mapping of Flow Monitoring Sites

EQUIPMENT COMPONENTS

- Equipment types to be used
- Use of SCADA System
- Data acquisition plan

DEPLOYMENT SCHEDULE

QA/QC PROCEDURES

3.4 FLOW MONITORING IMPLEMENTATION

Sewer flow monitoring information shall be used to characterize the performance of the sanitary sewer system during dry and wet weather flow conditions and to characterize the flow conditions that cause surcharging and/or overflows within the system.

3.4.1 Data Collection

Sewer flow, force main pressure, and rainfall information shall be collected (downloaded) at periodic intervals for the duration of the monitoring period. In cases where area-velocity meters are used to monitor flow in gravity sewers, a site visit after a major storm event is advisable to confirm meter conditions and to download the meter data. Data logging of the sensor readings shall be as described in Section 3.3.4.

Electronic transmission or collection of data for flow monitoring and rainfall gauging sites is desirable, where feasible and appropriate.

3.4.2 Data Summaries

Flow data summaries to be included in the flow evaluation report shall present the flow data and observed flow conditions supported by graphical and tabular presentations of flow, wet well level, velocity, and pressure in the context of the rain events. Each summary shall include the following information:

- Graphical representation of data

A graphical time-series plot (hydrograph) of flow rate vs. time data, as well as associated recorded rainfall data, shall be presented for each specific flow monitoring method below.

Additional data summaries for various flow-monitoring methods are suggested below:

- Open Channel Flow Meters: Graphs (scatter graph) of flow depth versus velocity
- Force Main Flow Meters: Graphs of flow rate and associated system pressure versus time
- Volumetric Flow Calculation: Graphs of wet well levels and calculated flow rate
- Alternate methodologies for flow measurement and hydrograph development: Verified pump and system curves

- Tabular data

A tabulation of daily average, maximum, minimum, and peak hour flow rate recorded during the flow-monitoring period shall be presented. The following data shall be tabulated for each specific flow metering method:

- Open Channel Flow Meters:
 - Time
 - Flow depth
 - Velocity
 - Flow rate
- Force Main Flow Meters:
 - Time
 - Flow rate
 - Pressure
 - Pump run status
- Volumetric Flow Calculation:
 - Time
 - Wet well levels
 - Pump run status
 - Pump run times
 - Flow rate calculation
 - Pressures, where available
- Alternate methodologies for flow measurement and hydrograph development:
 - Time
 - Wet well levels
 - Pump run status
 - Pump run times
 - Discharge pressure data
 - Flow rate calculation
 - Other data as necessary to verify the appropriateness of the approach and quality of the results
- Installation report. A summary of the installation details associated with each meter location, including a sketch of the manhole, wet well and/or force main configuration details and identifying related installation information.
- A rainfall analysis that estimates the rainfall recurrence interval for significant rainfall events.

3.4.3 Data Storage Format and Warehousing

The metered data shall be stored in an open data format that can easily be accessed in an ODBC (Open data base connectivity) compliant format.

Data for each meter should be uniquely identified and shall be distinguishable from the data from other meters. Further, the data shall be labeled and stored in a manner that will allow ease of site location identification and determination of the dates on which the data were collected.

3.4.4 Instrument Maintenance

Instrument operation shall be checked periodically. Problems with the instrument shall be corrected as soon as possible to sustain data collection at the highest level.

3.5 SEWER FLOW EVALUATION

The primary objectives of the flow evaluation are to characterize sewer flow under a range of hydrologic conditions, quantify peak flow for the purposes of identifying SSes Basins, and to develop the hydrographs needed to calibrate a hydraulic model. The sewer flow evaluation shall include quantification of base sewage flow, dry weather infiltration (DWI) and rainfall-derived inflow/infiltration (RDII) using the following procedure:

- Separate periods of dry and wet-weather flow with respect to rainfall data
- Establish a typical 24-hour, dry-weather sewer hydrograph
- Estimate DWI by determining average flow rate during off peak hours
- Extract RDII by subtracting the dry-weather flow hydrograph from the wet-weather hydrograph for the event or events of interest (Water Environment Research Foundation, *Using Flow Prediction Technologies to Control Sanitary Sewer Overflows*, 1999)

3.5.1 Data Analysis

The first step in determining the I/I reduction potential is to quantify the base sewage flow, the DWI and the RDII. This is done by compiling and reviewing of historical water consumption records and then comparing the results to the actual wastewater flow meter data collected as described previously. The following sections describe processes for determining each component of the total wastewater flow.

3.5.1.1 Base Sewage Flow

Water consumption data for the previous two (2) year period shall be used for the base sewage flow determination by assuming 100 percent of the metered water consumption is returned to the sanitary sewer system as sewage flow. Where a Locality has more accurate information to support application of a percentage return value to the water consumption data to estimate base sewerage flow, the data shall be used in the base sewage flow estimation. This may include application of flow return values to account for specific usages, such as irrigation, where specific usage was known to occur during the flow-monitoring period.

3.5.1.2 Dry Weather Average Daily Flow (ADF)

The flow at each flow-monitoring site shall be used as the basis for determining the dry weather average daily flow (ADF) for the metered areas and for estimating the dry weather infiltration entering the sewers. In determining the ADF, days with rainfall (and the following 3 days) are normally to be excluded from the analysis. Dry day flows shall be recorded at each monitoring site and averaged to determine the shape of the average diurnal curve for each metered area. A comparison of average daily flows is suggested to identify anomalies in flow patterns. The diurnal curve for each metered area represents the dry weather ADF and shall be used as input to the hydraulic analyses.

3.5.1.3 Dry Weather Infiltration (DWI)

Dry weather infiltration for each metered area shall be estimated by subtracting the base sewage flow from the ADF. Engineering judgment shall be applied in the estimation of DWI.

3.5.1.4 Rainfall Derived Infiltration/Inflow (RDII) Evaluation

Flows occurring during and after rainfall events that are higher than the dry weather diurnal curve represent potential RDII. The extraneous flow quantity is estimated by subtracting the measured average daily flow diurnal pattern from the wet weather hydrograph. After taking into account temporal and usage variations, the accumulated extraneous wet weather flow volume can then be estimated. The extraneous wet weather flow quantity (in gallons) for each monitoring site can be divided by the total rainfall accumulation (in gallons) over the metered area to calculate an RDII factor, expressed as a percentage of the total accumulated rainfall that entered the sanitary sewer system. This evaluation shall be carried out to characterize the volumetric contribution of rainfall to the system for each significant rainfall event captured by flow metering.

The RDII volume and/or RDII factor shall be used in the prioritization of SSES Basins as described in Section 5.2.1, Identification of Areas for Inspection.

In addition to estimating the volumetric contribution of rainfall to the sanitary sewer system flow, peak one (1) hour flow shall be observed in conjunction with each rainfall event. The peak one (1) hour flow is critical for identifying basins that will require SSES activities as described in Section 5.1.

The rainfall-derived infiltration can be graphically observed in the receding portion of the wet weather hydrograph. After the rainfall event has passed and the peak flow response has passed, the slower decline of flow back to normal dry weather conditions may be an indicator of the wet weather infiltration. Volumetric quantification of this flow in the system can help determine the volume of I/I entering the system.

EXAMPLE

In a sanitary sewer basin with a service area of approximately 320 acres there was a total rainfall accumulation of 3-inches (0.25 feet) over the area, resulting in extraneous flows that were measured over a 24-hour period. The event generated a total flow volume of 4.15 million gallons (MG) in 24-hours. The average daily dry weather flow in the service area is 150,000 gallons per day. The RDII factor is calculated as follows:

Formula:

The extraneous wet weather flow is calculated by subtracting the average daily dry weather flow volume from the total flow volume generated from the rainfall event. The average daily dry weather flow used should be from the same general time period as the rain event, but using data from a typical dry week.
$$= 4.15 \text{ MG} - (150,000 \text{ gallon/day} / 1,000,000) = 4.0 \text{ MG}$$

$$\text{RDII Factor, \%} = 100 \times (\text{Measured volume of extraneous wet weather flow}) / (\text{volume of rainfall accumulated over the service area})$$

$$\text{Volume of Rainfall (million gallons)} = \text{Rainfall accumulation (ft)} \times \text{Basin Area (Acres)} \times 0.325 \text{ (conversion factor)}$$

Solution:

$$\text{Volume of Rainfall} = 0.25 \text{ ft} \times 320 \text{ acres} \times 0.325 = 26.0 \text{ million gallons}$$

$$\text{RDII Factor} = 100 \times (4.0 \text{ million gallons} / 26.0 \text{ million gallons}) = 15.4\%$$

3.5.2 Flow Evaluation Report

A summary report shall be prepared documenting the: 1) flow monitoring activities performed; 2) flow monitoring data collected; 3) flow analyses conducted; 4) findings; and 5) conclusions. These flow evaluation reports shall be used to determine SSES basins and to prepare the SSES Plan for the sewer system.

The evaluation report shall include the following information:

- TITLE PAGE

- Project Title
 - Locality Contact Information

- EXECUTIVE SUMMARY

- INTRODUCTION

- FLOW AND RAINFALL MONITORING METHODOLOGY & APPROACH

- Use of Existing Data
 - Monitoring Site Selection
 - Monitoring Equipment Used
 - Data Collection Activities
 - QA/QC Procedures

- MONITORED FLOW CHARACTERIZATION AND ASSESSMENT

- Data Analysis Overview
 - Water Usage for Base Flow development
 - Dry Weather Flow Analysis
 - Dry Weather Infiltration Analysis
 - RDII and Rainfall Analysis

- FINDINGS and CONCLUSIONS

- Discussions of Findings
 - Areas Meeting SSES Criteria

- APPENDICES

- Field Data
 - System monitoring location maps

SECTION 4 CONDITION ASSESSMENT OF SEWERS AND PUMP STATIONS

4.1 OBJECTIVE

Condition assessment of specific sanitary sewer system assets shall be conducted in order to develop a prioritized rehabilitation program that addresses deficiencies, which contribute to SSOs or decrease the existing capacity of the sanitary sewer system. If system assets are to be completely replaced under Section 7, Rehabilitation Plan, condition assessment shall not be necessary or may be deferred. This section provides guidance on development of condition assessment programs to be incorporated into SSES Plans per Section 5 based on the background data review, flow monitoring, and specific problems that are identified.

4.2 DATA NEEDS AND DATA MANAGEMENT

The initial flow monitoring and system data review will give an indication of the field investigations that are necessary to further assess the condition of assets within SSES Basins. Condition assessment requires that certain data be collected to describe the facilities in the SSES Basins and their condition. Various investigation methods can be used to assess the infrastructure components and collect asset information. An example of the types of investigative activities that may be used to assess a range of issues is presented in Table 4-1. The matrix provides general guidance as to appropriate field investigations that may be used to assess the various infrastructure elements.

Data collected during the field investigations will indicate the existing condition of assets within SSES Basins. That information should be compiled in an Information Management System (IMS), such as a computerized maintenance management system (CMMS), if available. The collected information can be managed within the IMS and GIS systems to facilitate rehabilitation planning and execution. At a minimum, the data shall be stored in an open data format that can easily be accessed in an ODBC (Open data base connectivity) compliant format.

Attachment 1 to the Special Order by Consent -- Regional Technical Standards
Section 4 -- Condition Assessment of Sewers and Pump Stations

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Table 4-1 Example Field Investigation Data Needs Matrix

	Records Review	CCTV Mainline	CCTV Lateral	Manhole Inspection	Smoke Testing	Dye Testing	Night Flow Isolation	Pressure Monitoring	Flow Monitoring	Ground Water Monitoring	Rainfall Gauging	Hydraulic Modeling	Pumping Test	Wet Well Inspection	Pump Run Time Assessment
SERVICE LATERALS -- PUBLIC SIDE															
Capacity															
Evidence of I/I			•		•	•		•		•					
SSOs			•		•	•		•							
Surcharging			•					•							
Structural Condition															
Material Stability			•												
Age	•														
Maintenance															
Roots	•		•												
Grease	•		•												
MAINLINE SEWERS															
Capacity															
Evidence of I/I	•	•			•	•	•		•	•	•	•			
SSOs	•	•			•	•	•		•	•	•	•			
Surcharging	•	•				•			•	•	•	•			
Min Slopes or Grade Reversal	•	•													
Structural Condition															
Line Failure	•	•			•	•									
Sags		•													
Joint Misalignment		•			•	•									
Defect Rehabilitation	•	•			•	•									
Age	•	•			•										
Maintenance															
Roots		•													
Grease		•													
MANHOLES															
Capacity															
Evidence of I/I						•	•		•	•	•	•			
SSOs						•	•		•	•	•	•			
Surcharging						•			•	•	•	•			
Structural Condition															
Material Stability						•									
Age						•									
Maintenance															
Roots	•			•											
Grease	•			•											
FORCE MAINS															
Capacity															
Excessive System Pressure	•							•		•	•	•	•		•
Surcharging	•								•	•	•	•			
SSOs	•								•	•	•	•			
Structural Condition															
Air Vents	•														
Pipe Failures	•														
PUMP STATIONS															
Capacity															
Excessive Pump Runtimes	•								•	•	•	•	•		•
Surcharging	•								•	•	•	•		•	
SSOs	•								•	•	•	•		•	
Structural Condition															
Material Stability	•													•	
Age	•													•	
Operations															
Air Entrainment	•													•	

4.3 FIELD INVESTIGATION APPROACH

The objective of the field investigation is to provide an appropriate level of system information to support sound rehabilitation and/or replacement decisions, and identify I/I sources that require abatement.

Field investigations shall be conducted in a comprehensive or phased approach to identify deficiencies in SSES Basins. A phased approach may be used to progressively evaluate and screen SSES Basins. For example, if an SSES Basin has been so designated due to excessive pump run times, it may be beneficial to evaluate the pump station operating conditions prior to initiating a detailed investigation of the tributary gravity sewer system. Table 4-2 depicts an example of how a phased investigation approach may be planned.

Table 4-2 Example of Phased Field Investigation Approach

I	Initial Field Reconnaissance & Records Review <ul style="list-style-type: none">■ Manhole Checks■ Pump Station, Wet Well, and Force Main Evaluation■ Critical Location Inspection Determination
II	Limited Field Inspection <ul style="list-style-type: none">■ Manhole Inspections■ Smoke/Dye Testing■ Limited CCTV/Digital Imaging Inspection Associated with Dye Testing■ Night Flow Isolation
III	Comprehensive Field Evaluation <ul style="list-style-type: none">■ Comprehensive CCTV/Digital Imaging Inspection■ Comprehensive Manhole Inspections
IV	Prompt Attention to Identified Severe System Deficiencies <ul style="list-style-type: none">• Find and Fix Level of Identification and Repair

Various types of investigations can be used to identify where rehabilitation or repair work should be performed and to determine the type and extent of rehabilitation. In SSES Basins that have known I/I problems or defects that have resulted in SSOs, a comprehensive condition assessment of the gravity sewer system may be initiated without the need for a phased approach. The field investigation techniques described herein may be undertaken as a comprehensive field evaluation or may be focused on a specific field activity where known problems exist. The field reconnaissance program should be based on the background data review, flow monitoring data, pump run time analysis, existing condition assessment and SSES reports, evaluation of SSO history, sewer service call history; and review of engineering and operations information.

4.4 PROCEDURES FOR ASSESSMENT ACTIVITIES

The following procedures for sanitary sewer assessment activities define available and consistent techniques to be used in field investigation. Performing these activities in a consistent manner will aid in the evaluation of data, and can provide a regionally common basis for condition assessment.

The following sections provide guidelines for conducting field investigation of sanitary sewer systems. Activities that may be implemented include:

- Gravity Sewers
 - Manhole Inspections
 - CCTV Inspections
 - Smoke Testing
 - Dye Testing
 - Night Flow Isolation
- Pump Station Inspection
- Force Main Assessment

4.4.1 Gravity Sewers

Gravity sewers shall be inspected for structural conditions, capacity problems and maintenance issues, which may negatively impact performance. Gravity sewer inspections shall include manhole inspections, CCTV inspections, smoke testing, dye testing, and night flow isolation, as appropriate.

4.4.1.1 Manhole Inspections

One of the most useful methods to determine sanitary sewer system condition is to perform and document inspections of manholes. Manholes have the potential to allow significant quantities of I/I into the sanitary sewer system (such as when manhole lids are lower than the surrounding surface and drain storm water when streets are flooded during wet weather). Manhole inspections can also provide indication of surcharged conditions in mainline sewers. Manhole inspections should be conducted to obtain information on manhole conditions and to observe sewer flow conditions, including indications of unacceptable surcharging. Manhole inspections shall be conducted in SSES Basins that potentially have I/I problems. Manhole inspections shall be conducted in accordance with NASSCO standards.

In conjunction with manhole inspection activities, manholes and cleanouts in areas subject to flooding, ponding, or submerged tidal conditions should be observed and noted. It should be noted if the cleanout is broken or if the manhole cover allows ponded water to enter the manhole.

A topside (or non-entry) manhole inspection should be conducted to determine overall structural condition of the manhole. The surrounding area should be observed and noted if the manhole is located in an area that is conducive to flooding over the top of the manhole.

Manholes found to be surcharged may need to be re-inspected during a lower flow period. If a topside manhole observation provides evidence of the manhole being a significant I/I source, an internal manhole observation (i.e., pole camera or manhole entry) should be made to specifically determine what defects exist in the manhole and its connecting pipes. This information should be used to determine what corrective measures will be needed to correct the observed deficiencies.

Each manhole shall be assigned a unique identifier. The manhole identifier will be used to identify each manhole where an inspection is performed. Information and condition ratings should be collected on the manhole cover, frame, adjustment rings, cone, steps, wall, bench and channel as well as connecting influent and effluent pipelines.

4.4.1.2 CCTV Inspections

CCTV inspection should be used to assess the condition of sewer lines by identifying structural problems, points of inflow and infiltration, capacity issues, and system blockages. The data collected should be compatible with and easily integrated by the Utilities' IMS. The CCTV inspection shall be conducted and recorded in accordance with NASSCO PACP© standards.

4.4.1.3 Smoke Testing

Smoke and/or dye testing should be conducted as part of the evaluations in areas that are suspected to have inflow problems. Limited CCTV inspections should be used in conjunction with smoke testing to verify the location of cross connections and inflow sources that are identified.

Smoke testing shall be carried out in conformance with widely used industry guidance such as EPA Handbook 625/6-91-030 *"Sewer System Infrastructure Analysis and Rehabilitation"* Section 4.3.6, and WEF Manual of Practice FD-6 *"Existing Sewer Evaluation and Rehabilitation"*.

The entire section being tested should be visually inspected by walking along the route of sewer line watching for smoke leaks. The location of smoke leaks should be marked, noted, numbered and photographed. The photograph number corresponding to each leak should be noted. Cleanouts and failures that are observed to produce smoke should also be noted if they are in an area subject flooding.

4.4.1.4 Dye Testing

Dyed water testing may be used to verify connectivity, direction of flow, sources of I/I, as well as illicit connections to the system. Dye testing may be used to complement smoke testing to verify these sources.

Prior to dye testing, the line to be tested should be cleaned. The down stream manhole should be monitored to observe if dyed water passes through the system and the estimated quantity

noted. If sufficient dye water passes through the downstream manhole, a CCTV inspection may be performed to identify the location and magnitude of the source of flow.

4.4.1.5 Night Flow Isolation

Nighttime flow isolations may be used to trace sources of infiltration. Night flow isolations may be used to locate and quantify the amount of infiltration entering a sewer system. Night flow isolations are typically performed to narrow down and identify reaches that have excessive infiltration that can be pinpointed for further investigations.

Night flow isolations typically are performed during low flow periods, between the hours of midnight and 6 AM. The flow measurement should be conducted with a weir structure that is suitable for the size pipe being isolated. The upstream reaches should be plugged, whenever flow conditions warrant, to provide a quantification of infiltration in each reach of line. When flow conditions do not allow for plugging, differential measurements should be used upstream and downstream for the section of pipe being investigated. Any known sewage flows that contribute flow normally under nighttime conditions in the line under investigation should be noted for the section of line under investigation.

4.4.2 Pump Stations

Pumping stations shall be inspected for structural conditions, capacity problems and maintenance issues, which may negatively impact performance. Typical maintenance issues include, but are not limited to:

- Grease: Grease buildup interferes with station operation by inhibiting the operation of level sensors.
- Impeller wear: Entry of sandy soil and grit into the wet wells by way of structural defects in the gravity sewers reduce effective wet well capacity and cause excessive impeller wear.
- Mechanical and electrical failures: Inadequate preventive maintenance increases the risk of mechanical and/or electrical failures.
- Excessive pump run times can be an indicator of capacity issues or equipment wear.
- Influent surcharge: Improper “pump on” set point or inlets constructed close to pump centerline can lead to influent pipeline surcharge.
- Wet-well surcharge, SSOs: System head on manifolded networks exceeds the pumping capability of the pumping station or influent flow that exceeds pumping capacity can lead to overflows and excessive pump runtimes.

Pumping station inspections and evaluations shall be conducted in a consistent manner. Visual inspections should be made of various features of the pumping station, and the results

documented. Some of the key information that should be obtained during the inspection is outlined below.

Building Condition: Visually inspect the interior, exterior and roof of the building for physical or structural problems and record defects that may lead to SSOs.

Pumps and Motors: From the manufacturer's data plates and any up-to-date maintenance information, record the pump head in feet, the capacity in gallons per minute and the impeller diameter in inches for each pump. Record the horsepower and listed RPM for the motors. Observe the pumps and motors for vibrations, sounds, temperature and odor. The operating logs should be reviewed. The operations staff should be consulted to determine under what conditions and how long all pumps operate at the same time.

Wet Well: Inspect the wet well in a dewatered state to ensure a complete and proper visual inspection. Accumulation of debris, sediment and grease buildup should be removed when the wet well is drained for the inspection. The walls should be observed for coating condition, spalling or softness of concrete, erosion of concrete and the condition of bottom fillets.

Corrosion of Ancillary Equipment: While the wet well is in a dewatered state and after cleaning, inspect the ventilation system ducts and fans, access hatch, interior railing, access ladder and platforms, pump control system, pump rails, and interior piping for corrosion.

Dry Well: Inspect the dry well for structural conditions of concern.

Piping: Visually inspect the piping, valves (check, isolation, surge relief and air relief) and other fittings for corrosion, leakage, coating system condition, and proper operation.

Emergency Generator/Pump: Observe the generator/pump while running under load to verify its operation, noting excessive noise, dark exhaust, and ease of generator/pump starting. Test to ensure that the device will automatically start upon loss of power.

Air Entrainment: Air entrainment into the pumping system and force main can create hydrogen sulfide buildup and corrode system piping and appurtenances. This corrosion can lead to system failures and create SSOs. Air entrainment can also create a loss of capacity. Several activities can be performed to reduce the potential for air entrainment into the system. These include:

- Minimum wet well levels should be set to a point where pumps do not entrain air.
- Pump packing and stuffing box should be adjusted so air is not entering the pump.
- Piping including inlet, bleed-off, sump pump piping and relief flows should be plumbed to avoid cascading into the wet well causing excess agitation.
- Screening systems that catch debris should be inspected and cleaned regularly to ensure that excess build up does not create cascading of wastewater into the wet well.
- Air bubbler lines should be located away from pump inlets.
- Wet well mixer level settings should be verified to confirm that they are below the low water level and that they do not create vortexes.

- Air release valves should be inspected and maintained to ensure proper operation.

Pump stations and force main systems should be routinely inspected to make sure these potential sources of air are minimized to avoid excessive air entrainment. Corrections required to avoid these conditions should be noted and prioritized.

Pump Draw-Down Tests. Pump draw down tests provide a simple, accurate, and direct method to measure total pumping rate. Pump drawdown tests are conducted by measuring the volumetric change in the wet-well due to pump action. The test often requires temporary flow measurement on the influent sewer to account for the effects of incoming flow. This step may not be necessary if the wet-well can be isolated.

4.4.3 Force Main Condition Assessment

Force main routes, air vents, and aerial line crossings of streams and ditches shall be inspected for signs of leakage or failures. Aerial crossings shall also be visually inspected for debris accumulation, erosion of soil around pipe and supports, and structural support condition.

Force main condition assessments shall be conducted if a review of existing information indicates a history of failures. Force mains should be evaluated based on pipe material, age, reported condition, and occurrence of SSOs. Inspections should include air vents, mainline valves, aerial crossings and other key ancillary items.

4.4.4 Vacuum System

Several vacuum systems exist within the regional sanitary sewer system. Generally vacuum systems do not pose a major source of I/I unless illicit connections are made at the service tap. Because the system is constantly under negative pressure, failures are usually realized when a loss of vacuum occurs. Vacuum systems will be excluded unless there are unresolved overflows.

4.5 ASSESSMENT STANDARDS FOR GRAVITY SEWER SYSTEM

4.5.1 National Association of Sewer Service Companies (NASSCO)

In an effort to standardize sewer pipe defect coding and ratings in the United States, NASSCO has developed industry-accepted standards. NASSCO has also developed rating standards for manhole and lateral defects as well. The following programs have been developed by NASSCO:

- A standard coding system
- A training and certification program
- Standardized data format
- A certification for data collection software vendors
- Mapping symbology standards

- A standard condition rating system

All defect coding and condition assessment shall be based on NASSCO standards to provide consistency.

4.5.1.1 Pipeline Assessment Certification Program (PACP)

The PACP establishes standards for the assessment of sewer mains using information obtained through CCTV inspections. This standard will be used to assess, evaluate and categorize gravity mains within the sanitary sewer systems.

4.5.1.2 Manhole Assessment Certification Program (MACP)

The MACP uses the established defect coding system found in the PACP and incorporates many of the American Society of Civil Engineers (ASCE) manhole standards as well. The MACP standard will be used to assess, evaluate and categorize manholes within the sanitary sewer systems.

4.5.1.3 Lateral Assessment Certification Program (LACP)

The LACP uses the same defect coding system found in the PACP because of the similarities between main line systems and laterals. This standard will be used to assess, evaluate and categorize lateral systems within the sanitary sewer systems.

4.6 FIND AND FIX GUIDELINES

4.6.1 Conditions to Warrant Prompt Repairs

Certain asset conditions will warrant prompt corrective action when found during the course of the SSES work. Defects that pose an imminent risk of failure and warrant prompt repair under a Find-and-Fix approach may include, but are not limited to, partially collapsed pipe, pipe with holes (missing sections), pipe with extensive exposed rebar (concrete), joints that are displaced more than 10% of the pipe diameter, and pipe with displaced bricks, where such defects are determined to:

- Pose an immediate threat to the environment
- Pose an imminent threat to the health and safety of the public
- Create operational problems that may result in SSOs
- Contribute substantial inflow to the system

These assets may be operable at the time of discovery but could have potential for severe consequences and a high likelihood of failure.

4.6.2 Procedure

Conditions that warrant prompt repairs shall be considered under a "Find and Fix" rehabilitation approach. The Find and Fix methodology employs the concept that when

failures or deficiencies are found, actions are taken to correct the problem either by internal maintenance personnel or an on-call contractor. Either should be capable of assessing the need for repair and of performing the repairs according to acceptable industry standards.

The Find and Fix concept provides a process by which system repairs can be made in a more timely fashion. Table 4-3 depicts the typical steps in a Find-and-Fix approach. Comparison to the traditional design-bid-build approach is shown to demonstrate differences in the approaches that may result in time and cost savings.

Table 4-3 Typical Find-and Fix Rehabilitation Steps

Sequence of Activities	Traditional Approach	Find and Fix Approach
Procurement	■ Procure Engineer and/or Field Investigation contractor	■ Procure contractors for on-call services
Field Investigation and Decision-Making	■ Review available information ■ Perform sewer condition assessment ■ Prepare study report	■ Review available information ■ Perform sewer condition assessment ■ Prepare rehabilitation justification and work orders
Planning and Engineering	■ Develop Capital Improvement Plan (CIP) projects and budgets ■ Prioritize projects ■ Perform engineering and create plans and specifications	■ Utilize standards specifications to conduct work
Rehabilitation Construction	■ Procure contractor(s) ■ Perform rehabilitation ■ Document and monitor results	■ Perform additional conditional assessment and rehabilitation ■ Document and monitor results

The types of repairs that are practical for Find and Fix programs include:

- Manhole reconstruction
- Pipeline reconstruction
- Point repairs and section liners
- Cured-in-place lining, slip lining and pipe bursting
- Manhole lining

4.6.3 Removal of Illicit Connections

Illicit connections that contribute substantial inflow to the sanitary sewer system warrant prompt corrective action when discovered. Illicit connections that are identified with the publicly owned portions of the sanitary sewer system shall be eliminated through a Find and Fix rehabilitation approach, where practical. Such connections may include storm drains and area drains that are directly connected to the sanitary sewer.

4.7 PRIVATE SOURCES OF I/I

Private property I/I sources may include roof drains, area and foundation drains, defective laterals, and private sewers. HRSD and the Localities shall develop and implement a Private Property I/I Abatement Program. The Private Property I/I Abatement Program will require, to the extent allowed by law, the correction of identified private system deficiencies.

4.8 CONDITION ASSESSMENT DOCUMENTATION

Upon completion of the field investigations, documentation shall be prepared that references the field procedures used and presents the investigation results, alternative analyses, findings, conclusions, and recommendations. These documents will be used to prepare the rehabilitation plan as described in Section 7. The documentation shall include the following minimum content:

- **TITLE PAGE**

- Project Title
 - Locality Contact Information
 - Vicinity Map

- **TABLE OF CONTENTS**

- **INTRODUCTION**

- Purpose
 - Scope
 - Background
 - Vicinity Map

- **METHODOLOGY AND INVESTIGATIVE APPROACH**

- **EXISTING FACILITY EVALUATION**

- Inventory of Sanitary Sewer System
 - Pumping Station Inspection
 - Condition Assessment Evaluation

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Field Investigation Results

- Manhole Inspections
- CCTV Inspections
- Smoke Testing
- Dye Testing
- Night Flow Isolations

• FINDINGS, CONCLUSIONS & RECOMMENDATION

• APPENDICES

Field Data (Compiled Raw & Analyzed)

System overview and detailed maps, for all project types

Note: This format is a general guideline to be used by in sewer basin investigations.

SECTION 5 SSES PLANNING

An SSES Plan shall be developed considering the results of sewer flow monitoring and other relevant information, including the SSO characterization analyses. The plan shall identify SSES Basins; the activities to be performed in those basins; and a schedule for conducting the SSES work. SSES Basins shall be selected based on the criteria presented in Section 5.1 in conjunction with utility personnel knowledge of the system.

5.1 SSES BASIN CRITERIA

Sewer basins that are known or suspected of meeting the following criteria shall be included in the SSES Plan:

- Basins with unresolved wet-weather SSOs, except where SSOs have only resulted during rainfall conditions in excess of a 10 year, 24 hour rainfall recurrence interval
- Basins with unresolved SSOs caused by infrastructure defects (pipe sags, offset joints, broken pipe, etc.)
- Basins exceeding an actual peak flow of 775 gallons per day per equivalent residential unit plus 3 times commercial water consumption plus actual major industrial flows, where this peak flow is estimated to occur during rainfall conditions up to a 10-year, 24 hour rainfall recurrence interval
- Basins served by pump stations that exhibit excessive pump run time

Because some sewers are considered less critical and the probability of wet weather SSOs are small, the following basin and system types may be excluded from SSES activities where appropriate, unless there have been preventable SSOs in the system:

- Vacuum systems
- Basins associated with small pump stations (25 gpm or less pumping rate at design pressure)
- Low pressure force main systems where the agency maintains the force main, but all contributing pump stations are privately owned

5.2 SSES PLAN DEVELOPMENT

An SSES Plan shall be developed to meet the following objectives:

- Identify and prioritize basins for investigation
- Establish baseline estimates of I/I
- Select the detailed approach to provide sufficient information for condition

- assessment activities including hydraulic, corrosion and structural investigation
- Coordinate improvements to records and mapping that may be needed
- Establish a schedule of activities

Prioritization of basins for investigation may be based on the following:

- An initial estimate of potential volume of I/I reduction in each basin (i.e., gallons per day)
- The number and severity of SSOs that occur within the basins
- Historical information about the system such as number of repairs and operation and maintenance history (including pump stations and force mains)

The typical approach to detailed investigations is to perform preliminary evaluations as a basis for ascertaining the need for further detailed field investigations. For example, when the case can be clearly identified for replacement of certain reaches of sewer mains based on initial field reconnaissance, supplemental field investigations may not be cost effective or necessary. Conversely, there may be cases where the cost of further detailed investigations can potentially result in project cost savings through better defining the required scope of upgrade work.

Information from the field investigations is used to evaluate sanitary sewer system conditions. Field investigations to be used in the SSES are detailed in Section 4, and generally include:

- Gravity Sewers
 - Manhole Inspections
 - CCTV Inspections
 - Smoke Testing
 - Dye Testing
 - Night Flow Isolation
- Pump Station Inspection
- Force Main Assessment

A minimum investigative program in all SSES Basins shall include pump station evaluation, manhole checks, and determination of critical inspection areas. At a minimum, SSES Basins that exhibit wet weather flows in excess of the peak flow threshold shall be evaluated using smoke testing, and all gravity sewer locations that have identified unresolved dry weather overflows shall be investigated with CCTV.

5.2.1 Identification of Areas for Inspection

SSES Basins shall be selected based on the criteria established in Section 5.1 and best available information about the system. These areas need to be uniquely identifiable to track SSES activities and for ease of reference.

Each basin shall be inventoried to identify the specific facilities that will be investigated and scope of the investigation. Verification of system connectivity will also be necessary to trace sources of I/I. This shall include mapping of:

- Pipelines
- Manholes
- Pump Stations
- Pumps
- Force Mains
- Valves
- Air Release Valves
- Flow Control Structures
- Stream or Aerial Crossing
- Siphons

Once the areas are identified for SSES activities, priority should be given to the basins based on at least five (5) criteria. The criteria may be weighted based on relative factors of importance and criticality. Each criterion should have an established weighting and ranking system. The prioritization and ranking used by one Locality may not necessarily be appropriate for prioritization and ranking used in another Locality. SSOs and conditions leading to environmental, public health, or safety risks will be given the highest priority, regardless of the weighting factors that may be applied. The minimum criteria to be considered shall include:

- Number and severity of preventable SSOs
- I/I volume
- Peak one hour flow
- Operations and maintenance history
- Sewer basin criticality factors

An example of the use of a ranking scheme to prioritize basins for SSES activities is offered below. This example is for illustration of applying prioritization criteria. Individual localities may apply weighting criteria differently and/or may add additional criteria. In any case, the SSES Plan should establish a prioritization system that uses the above criteria as a minimum. This prioritization only impacts the sequence of SSES activities to be conducted. All SSES Basins shall be investigated within the overall timeframe set forth in these Standards.

EXAMPLE

In a sanitary sewer system "A" having 55 basins identified for SSES, the following ranking was given to a particular basin relative to the other basins. This is assuming 1st ranked is the highest priority and 55th ranked is the lowest priority of the 55 basins.

Ranking was determined as follows:

- Number of SSOs 30 points
- Peak one hour flow 30 points
- I/I volume 20 points
- O/M history 10 points
- Sewer basin criticality 10 points

Total available Points: 100 points

Formula:

Parameter Weighted Ranking = $((\text{Number of Basins} + 1) - \text{Basin Rank for this Parameter}) / \text{Number of Basins} \times \text{Number of Points for the Parameter}$

Basin 1

I/I volume:	12 th	$((56 - 12)/55) \times 20 \text{ points} =$	16.0
Peak hour flow:	1 st	$((56 - 1)/55) \times 30 \text{ points} =$	30.0
The number of SSOs:	10 th	$((56 - 10)/55) \times 30 \text{ points} =$	25.1
O/M history:	20 th	$((56 - 20)/55) \times 10 \text{ points} =$	6.5
Basin criticality	30 th	$((56 - 30)/55) \times 10 \text{ points} =$	4.7

Basin 1 Total Points = 82.3

Basin 2

I/I volume:	15 th	$((56 - 15)/55) \times 20 \text{ points} =$	14.9
Peak hour flow:	8 th	$((56 - 8)/55) \times 30 \text{ points} =$	26.2
The number of SSOs:	5 th	$((56 - 5)/55) \times 30 \text{ points} =$	25.1
O/M history:	4 th	$((56 - 4)/55) \times 10 \text{ points} =$	9.5
Basin criticality	40 th	$((56 - 40)/55) \times 10 \text{ points} =$	2.9

Basin 2 Total Points = 78.6

Therefore Basin 1 has a higher priority for SSES than Basin 2.

5.2.2 Implementation Schedule

All work related to the SSES Plan shall be completed prior to the submittal of the Rehabilitation Plan described in Section 7. A detailed schedule for conducting the SSES work shall be established in the SSES Plan, which shall be reviewed and approved by DEQ.

In general, the sequence of activities is as follows:

- Review of Existing Information to Characterize SSOs and Identify Data Gaps
- Flow Monitoring Program Development and Implementation
- Development and Submittal of the SSES Plan
- Execution of the SSES Plan
- Prompt Attention to Severe Defects
- Rehabilitation Planning
- Hydraulic Performance Assessment
- Preparation of the Regional Wet Weather Management Plan

A specific schedule outlining the activities to be conducted shall be established for inclusion in the SSES Plan. The schedule shall include the following milestones:

- Completion of Flow Evaluation Reports within 20 months of the effective date of the Order
- Completion of SSES Field Activities within 50 months of the effective date of the Order. Notification that field activities have been completed shall be submitted to DEQ within one month following completion of the work.

SECTION 6 HYDRAULIC PERFORMANCE ASSESSMENT

6.1 USE OF HYDRAULIC MODELS

Calibrated hydraulic model(s) of the Regional Sanitary Sewer System shall be used to support the following objectives:

- Assessment of the regional sanitary sewer system performance with respect to capacity
- Development of the Regional Wet Weather Management Plan, including:
 - Alternatives analysis
 - Operational scenario testing
- Design testing and optimization

6.1.1 Capacity Assessment

A capacity assessment shall be conducted to estimate the performance of the existing Regional Sanitary Sewer System under conditions of interest. The hydraulic model shall be used to perform the capacity assessment, and shall include the following minimum conditions of interest:

- Baseline dry weather flows, current conditions and 2030 population
- 2-year peak flow recurrence, current conditions and 2030 population
- 5-year peak flow recurrence, current conditions and 2030 population
- 10-year peak flow recurrence, current conditions and 2030 population

Current conditions refer to the state of the regional sewer system at the time of model development, inclusive of any sanitary sewer system construction projects that are currently underway at the time of the model development. Near term projects will be included in the “current conditions” where prudent and will be decided on a case-by-case basis.

The use of the model allows estimation of performance under conditions that may not have been observed and/or documented in the system. The capacity assessment shall be conducted within the extent of the hydraulic model as defined in Section 6.4. The capacity assessment shall:

- Identify pumping stations that do not have adequate capacity to convey the peak flow under the above defined conditions
- Determine the probable cause of identified pumping station capacity limitations
- Evaluate causes of known unresolved capacity related overflows
- Predict locations and extent of potential SSOs

- Predict locations and extent of potential sanitary sewer system surcharges that may result in SSOs or impaired system performance

6.1.2 Regional Wet Weather Management Plan

The regional hydraulic model shall be used to analyze capital and operating alternatives to improve system performance and address capacity limitations in the regional sanitary sewer system. The Regional Wet Weather Management Plan shall be developed in accordance with the guidelines established in Section 8.

6.1.2.1 Alternatives Analysis. The hydraulic model will be used as a tool for evaluating capacity enhancement projects, including conducting the following activities:

- Estimating the impacts of I/I reduction projects, assuming the effectiveness of rehabilitation in reducing peak flows
- Evaluating capital improvements which increase the capacity of the sanitary sewer system, including pipe replacements, pumping station capacity improvements, and flow equalization facilities
- Quantifying the effectiveness and estimated system performance for each alternative or groups of alternatives

6.1.2.2 Operational Scenario Testing. Areas of the sanitary sewer system with operational flexibility shall be managed to optimize wet-weather performance. The Regional Wet Weather Management Plan shall include short and long term operating plans to maximize available capacity in the system through effective and proactive operations. This may require diversion of wastewater flow to alternate downstream facilities (i.e. pumping stations, interceptors or wastewater treatment plants) or activation of flow equalization/attenuation facilities. These operational scenarios shall be tested and optimized using the hydraulic model under a variety of flow conditions.

6.2 MODEL DEVELOPMENT PROCESS

The steps in the model development process are:

- Data collection
- Model building
- Calibration
- Verification
- Model use
- Documentation

Guidelines and requirements for each of these activities are included in this section. Although documentation is depicted as the last step in this process, good record-keeping

practices should be followed throughout the model development to facilitate documentation.

6.2.1 Model Requirements

The Regional Hydraulic Model shall possess the following capabilities:

- Fully dynamic hydraulic solution (i.e. model time-varying flows and depths representing the true nature of flow attenuation and translation)
- Minimal volume balance errors and numerical instabilities
- Model both gravity (i.e., open channel) and pressurized flows, simultaneously including the measurement of negative pressures and siphons
- Stable and robust solution for transitions between gravity and pressurized flows
- Stable pump controls including pump curves, switch on/off controls, variable speed pumps and real time control capabilities
- Model surcharged manholes with either storage of surcharged volume out of manhole lids and/or flow depth in excess of manhole depth predicted to overflow the manholes
- Capable of accepting diurnal curves and hydrographs as flow input

Locality models, as described in Section 6.2.4, shall use hydraulic analysis solutions that possess at a minimum, the ability to:

- Model both open channel and pressurized flows, simultaneously
- Predict locations of potential excess surcharge or overflows

6.2.2 Regional Model Development Process

Development of the Regional Hydraulic Model shall be a coordinated effort between HRSD and the Hampton Roads Localities. HRSD shall maintain the Regional Hydraulic Model. The Localities shall coordinate with HRSD to provide the necessary pumping station and pipeline information, as defined in Section 6.3, to construct the Regional Hydraulic Model. The Localities shall also provide HRSD with sewer flow hydrographs for the conditions indicated in Section 6.1.1 as inputs to the Regional Hydraulic Model.

It is recognized that model calibration may require the adjustment of input hydrographs provided by the Localities. HRSD and the Localities shall coordinate model development efforts to create a calibrated hydraulic model based on input data common and agreeable by both parties.

6.2.3 Physical Extent of Regional Hydraulic Model

The Regional Hydraulic Model shall be developed to the extent necessary to assess the performance of the system relative to capacity, and to develop the Regional Wet Weather Management Plan. At a minimum, the Regional Hydraulic Model shall include:

- All HRSD pipes, HRSD pumping stations, and HRSD pressure reducing stations, in the regional sanitary sewer system.
- Locality pumping stations and force mains that directly discharge into a HRSD interceptor sewer
- The gravity sewers extending one manhole upstream from each Locality pumping station that directly discharges to a HRSD interceptor sewer (Note that some pumping stations may receive discharge from multiple sewers; in these instances, the first upstream manhole on each line will be included)
- Locality gravity sewers extending one manhole upstream from the point of connection to an HRSD gravity interceptor

6.2.4 Locality Model Development Process

The Locality shall develop and maintain models of the sanitary sewer system upstream of the Regional Hydraulic Model. The Localities models shall include sewers and related facilities extending from any pumping station or gravity sewer in the Regional Hydraulic Model up to the location where any unresolved capacity related overflows are known to have occurred or suspected to occur based on review of pump station or other background data. The downstream boundary conditions of the Localities' models will be provided by HRSD based on the results of the Regional Hydraulic Model.

6.3 DATA COLLECTION

The following data are beneficial for the development, calibration and use of hydraulic models:

- Physical system data
- Population, demographic, and land use data
- Geographic information system (GIS) data
- Water use records
- Rainfall records
- Sewer flow monitoring records
- Operational information
- Force main pressure records

6.3.1 Physical System Data

Physical system data is information needed to describe the physical components of the sanitary sewer system such as gravity sewers, pumping stations, force mains, manholes, and other system features in the hydraulic models. These data are used to develop representative system elements in a hydraulic model.

Sources for this information include GIS, record drawings, sewer system maps, sewer survey data, and sewer inspection records (e.g. condition information). A review shall be conducted of collected data to ensure that the physical system data are of sufficient detail and are up to date. Data of questionable reliability shall be field verified, where appropriate.

6.3.1.1 Pipe Data. The following data pertaining to pipes shall be used in the development of the hydraulic model:

- Network connectivity (i.e., the pipe data record must include unique identification numbers for manholes or other structures at both ends of the pipe)
- Pipe size (nominal diameter)
- Length between manholes and/or junction structures and pumping stations
- Invert elevations (upstream and downstream)
- Material
- Pipe condition
- Force main or gravity sewer

The selection of a pipe roughness coefficient shall be made following an evaluation of the pipe diameter, material, and condition using engineering judgment. Appropriate coefficients from industry recognized sources shall be used for modeling. Consideration shall also be given to pipe roughness conditions where known heavy silt, debris, or slimes are found in the system. In the absence of pipe material or condition information, engineering judgment shall be used for the selection of an appropriate roughness coefficient.

6.3.1.2 Manholes and Junction Structures. Manholes and junction structures are structures that connect segments of pipe in the system. The following data shall be used in the development of the hydraulic model:

- Manhole ID
- Diameter/size
- Locations
- Invert elevation
- Rim elevation
- Ground elevation
- Sealed or unsealed lid
- Manhole inserts or similar devices

Head losses present at the entry and exit locations of manholes shall be included in the pipe data. Trunk and interceptor manholes having significant bends (i.e. > 45 degrees) should be considered for increasing the head loss coefficients based on the local hydraulic characteristics.

6.3.1.3 Pumping Stations. The following information shall be used in the development of the hydraulic model:

- Wet-well physical attributes (i.e. dimensions)
- Pumping capacity (i.e. pump performance curves, draw down test results)
- Number of pumps
- Type of drive (i.e. Variable speed or constant speed pumps)
- Control logic (i.e. wet well elevations at which each pump turns on and/or reaches full speed, and turns off)
- Piping details
- Flow equalization/storage physical attributes and control strategy (in-line or off-line storage)
- Bypass pump information, if such pumps were used during the flow monitoring period used for calibration

It is important to accurately represent the physical attributes of the pumping station and to program the model with the same control logic used to operate the station. Control logic includes triggers for turning the pumps on or off and/or for changing the pump speed when variable speed pumps are used. Pumping stations equipped with off-line flow equalization structures require additional data regarding the dimensions and elevations of storage, as well as the control logic and facilities that divert flow to, and return flow from, storage.

6.3.1.4 Other Boundary Conditions. Other boundary conditions that shall be considered include:

- Wastewater treatment plant (WWTP) headworks characteristics
- Weirs
- Pumping station records including flow, discharge pressure and wet well elevation
- Pressure reducing stations
- Other flow controls such as high pipes in manholes
- Control gates
- Siphons
- Downstream discharge conditions

The headworks conditions of a WWTP are particularly important to quantify. Since many models terminate at a WWTP, the headworks establish the outlet condition for the model. The headworks may include pumping equipment and associated controls similar

to a pumping station. Careful consideration should be given to how this type of outfall condition is developed in the model to provide an accurate representation of field conditions.

If present, weirs within the sanitary sewer system provide a method for controlling flow within the sanitary sewer system. Generally, weirs are located in manholes that join pipes between parallel sewers. These devices may not be conspicuous on sewer system maps or record drawings. When preparing a model, the modeler shall carefully examine all available records to identify the locations of weirs and connections between systems, such as short pieces of pipes between nearby manholes, which serve a similar purpose to weirs.

Inverted siphons present the situation where the flow depth is affected by the construction details of the structure. The elevations and sizes of all barrels of the siphon must be known for an accurate simulation. If flow to multiple barrels is controlled by weirs, the elevation of the weir crests must be known.

6.3.2 Population, Demographic, and Land Use Data

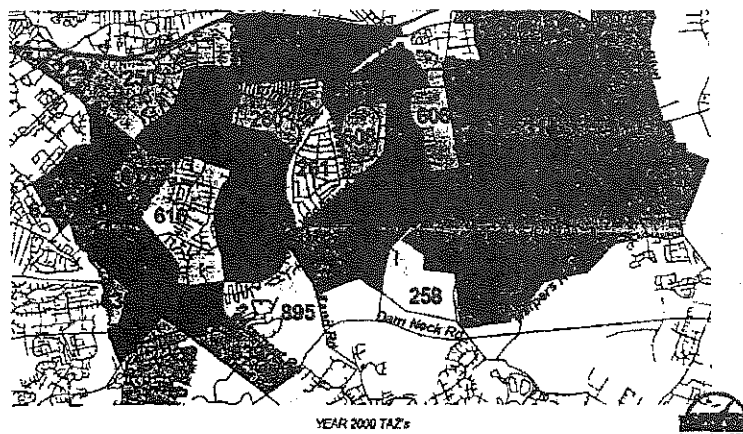
Population data are used to estimate existing and future sewer baseflows. These data are available from a number of sources, including:

- Transportation Analysis Zones (TAZ)
- Census data
- Land Use Planning and Zoning
- Parcel data

TAZ data shall be used as the primary source for population data. In situations where the study area is too small to effectively use these data, as discussed in this section, engineering judgment shall be used in conjunction with other population data sources to derive appropriate population data. TAZ data will not necessarily be used as the basis for final design of system improvements.

6.3.2.1 Transportation Analysis Zones (TAZ). The region is sub-divided into multiple TAZs. For example, the current TAZ mapping for the Holland-Oceana area of Virginia Beach is shown on Figure 6-1. Population and employment data are assigned to each TAZ. This information is disaggregated into multiple population categories such as residential, commercial, institutional (e.g. schools), and manufacturing.

Figure 6-1. Transportation Analysis Zones for the Holland-Oceana Area of Virginia Beach



Demographic data for each TAZ includes population projections for various horizon years (2010, 2020, etc). The most recent TAZ data includes population projections through the year 2030. TAZ data are developed and maintained by the Hampton Roads Planning District Commission (HRPDC).

In instances where modeling of areas smaller than those of TAZ areas are necessary, other, more granular data and engineering judgment shall be used to develop population estimates and projections. This data shall be verified for consistency with the TAZ population data.

6.3.2.2 Census Data. Detailed population data may be obtained (in GIS format) for census tracts and blocks that may provide finer coverage than TAZ data. These data are available for each Locality through the United States Census Bureau. These data do not generally provide a convenient breakdown of population into categories (i.e. residential, employment, industrial) or population projections. However, these data do provide spatial, baseline population data that may be used in conjunction with other data sources to estimate current and future populations.

6.3.2.3 Land Use Plans and Zoning. Land Use and Zoning Plans are maintained by the Localities to guide growth and development. These plans generally include future land use, which indicates the adopted zoning districts, and land uses for current and future development.

6.3.2.4 Parcel Data. Parcels refer to individual pieces of property. Where available in GIS format, parcel mapping is organized spatially and contains information regarding the land use of the specific property.

Parcel data may be used for developing highly detailed models of small areas, beyond the granularity available from other population data sources. These data provide spatial, baseline population data that may be used in conjunction with other data sources to estimate current and future populations.

6.3.3 Geographic Information System (GIS) Data

Readily available GIS data shall be used to support the data capture effort during the model building process. Specific uses of GIS include delineating sub-catchments, validating ground elevations, and identifying areas of flooding. Information of this type may include:

- Topographic mapping/digital terrain model
- Stream and hydrologic mapping
- Flood maps
- Sewer system maps (service areas, connectivity, accounts/billing information)
- Parcel information
- Land use information

This information is available from multiple sources including sewer system mapping, FEMA flood maps, and topographic maps that are maintained by various Localities.

6.3.4 Water Use Records

Water use data shall be used if available to validate baseflows calculated using population data. Water use data are recorded for each Locality's customer. It is possible to geocode the water consumption data based on the address of a meter to spatially distribute the water usage.

6.3.5 Rainfall Records

Rainfall data shall be used to estimate rainfall derived inflow and infiltration (RDII). Rain gauge data are available from both the U. S. Geographical Survey and efforts undertaken during the flow-monitoring phase. Hydraulic modeling generally requires rainfall data having a resolution of 1-hour or less. All data shall be reviewed for quality issues such as periods of missing data, or data from a defective rain gauge, before being used in hydraulic modeling.

Rainfall data are required that coincide spatially and temporally with the sewer flow data used to develop the model, as described in Section 3.3.5.

6.3.6 Sewer Flow Monitoring Records

Flow monitoring provides sewer flow data under known conditions. This information is used during model calibration, testing, and validation.

Flow monitoring data may be available from:

- Permanent flow monitors
- Temporary flow monitors
- Sewer system evaluation studies (SSES)
- Post sewer rehabilitation studies
- Wastewater treatment plant records
- Pumping station records including flow, discharge pressure and wet well elevation

Flow monitoring data collected in accordance with this Attachment shall meet the requirements presented in Section 3.3. The following locations shall be considered in the development of the flow-monitoring program:

- Sanitary sewer system outlet points
- Mid-points of large or complex sewer basins
- Branch sewers near the junction with a larger sewer where flow from the branch sewer is of concern
- Major sewers near the confluence of branch sewers
- Areas experiencing performance problems where modeling accuracy of such areas is important
- Specific points of concern such as siphons or weirs, where modeling accuracy of such points is important
- Points where ownership of sewer lines changes between HRSD and Localities

A series of data management activities are required to process and validate the flow, depth, velocity, and reaction to rainfall. These following activities support the model's calibration and validation:

- Preparation of a GIS layer, or alternative map, depicting flow meter locations
- Identification of the appropriate model node for each flow meter
- Conversion of the observed flow data into the model's flow data format

6.3.7 Operational Information

Operational records provide important qualitative and quantitative data about the performance of a sewer system. These data shall be considered for use during calibration to fine tune the model. The primary sources for these data are interviews with operation staff, SSO databases and maintenance logs. This data may also include records of pumping station discharge pressures. Operational criteria to consider include changes in system operation such as pump replacement, weir adjustments, surcharge, SSO volume, and frequency.

6.4 MODEL DEVELOPMENT

Model building is the construction of a hydraulic model using collected data. This process includes:

- Physical data entry
- Sub-basin delineation
- Baseflow estimation
- Rainfall derived inflow and infiltration (RDII) generation

6.4.1 Physical Data Entry

The data describing the collection system geometry will form the attributes and boundaries of the model. These data may be entered directly from GIS or from other database formats. Regardless of the data source, care shall be taken to ensure that the network connectivity and attributes are correctly represented in the model.

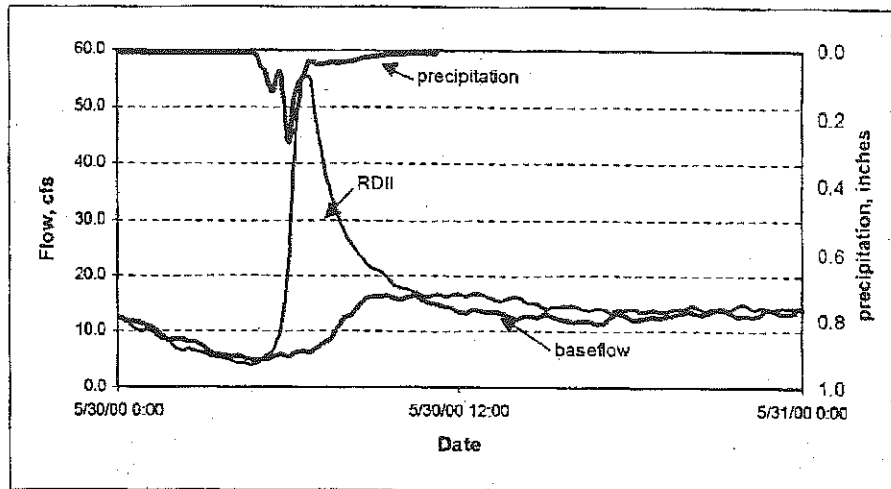
6.4.2 Sub-basin Delineation and Flow Assignment

Sub-basin delineation is the determination of tributary areas to various key points within the collection system. Flow assignment is the correlation of the flow from a tributary area to a specific node within the system. Sub-basins shall be delineated using a combination of sewer maps and topographic maps. Flow from tributary areas shall be assigned in a manner that represents the sewer systems characteristics.

6.4.3 Components of Flow

Sewer flow consists of baseflow and rainfall derived inflow and infiltration (RDII), as shown on Figure 6-2.

Figure 6-2. Components of Sewer Flow



6.4.3.1 Baseflow. Baseflow, also referred to as dry-weather flow, consists of domestic sewage flow and dry-weather infiltration. Domestic sewage flow is the sewage produced by individuals and businesses connected to the collection system. These flows shall be predicted based on population and per capita unit flow rates. DWI results from defects in the sanitary sewer system that are located below the water table that allow groundwater to enter the system.

DWI should normally be accounted for by applying a constant DWI rate above the population based domestic sewage flow.

6.4.3.2 Rainfall Derived Inflow and Infiltration (RDII). RDII is the component of total wastewater flow resulting from rainwater entering the sewer system.

RDII is generally a substantial portion of the total sewer flow that occurs during wet-weather. In many cases, particularly in older sewers, RDII may be the largest component of wet-weather flow. RDII varies with rainfall volume, rainfall intensity, antecedent moisture conditions, the condition of the collection system, and other factors, including storm driven tidal effects. The constituents of RDII are inflow and infiltration.

6.4.3.3 Separation of Base Flow and RDII. Total observed sewer flow shall be separated into baseflow and RDII using the following procedure:

- Separate periods of dry and wet-weather flow with respect to rainfall data
- Establish a typical 24-hour, dry-weather sewer hydrograph
- RDII is extracted by subtracting the dry-weather flow hydrograph from the wet-weather hydrograph for the event or events of interest

6.4.4 Baseflow Estimates and Projections

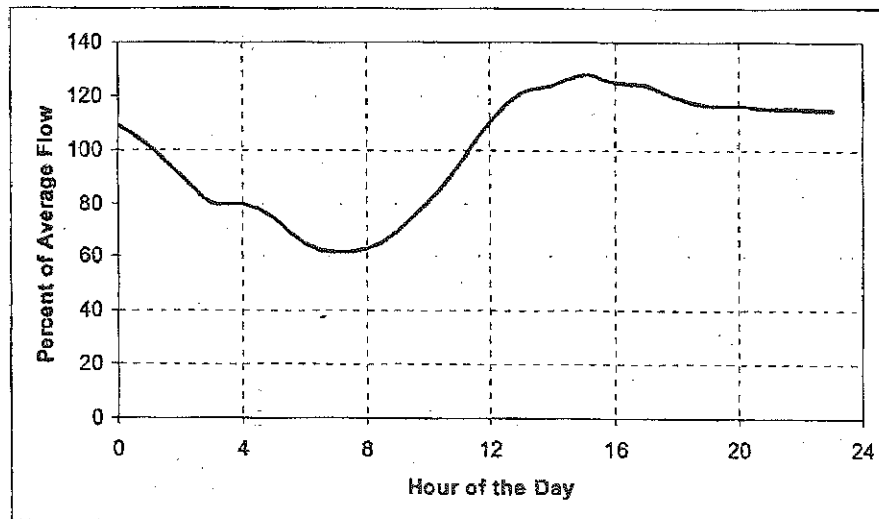
Baseflows are estimated by applying unit flow rates to population data plus the addition of DWI using the technique presented in Section 6.4.3.1.

Variability exists in all unit flow rates. Industrial unit flow rates, in particular, tend to have the greatest variation due to the volume of process water used in production, production schedule, and production methods. In the absence of industry specific information, consideration should be given to using flow monitoring to determine a suitable value based on engineering judgment.

It may be necessary during model calibration and testing to adjust the unit flow rates to match the observed baseflow.

6.4.4.1 Variations in Baseflow. Baseflow may vary daily, weekly, or seasonally. Daily variations in baseflow shall be accounted for using diurnal curves. Diurnal curves shall be normalized based on average daily dry-weather flow to produce a unit diurnal curve. Unit diurnal curves shall be used to develop dry-weather flow hydrographs based on observed or predicted average daily flow. Figure 6-3 illustrates a typical diurnal curve, normalized by average daily flow.

Figure 6-3. Example Diurnal Curve



Unit diurnal curves shall be created by:

- Developing a typical dry-weather hydrograph from a representative period
- Dividing the dry-weather flow hydrograph by the average daily dry-weather flow, for the representative period

This unit hydrograph can be multiplied by average daily flows for various population conditions. This provides a method to generate future hydrographs based on population projections. Ideally, several days of dry-weather flow data should be used for the development of the unit hydrograph, including weekdays and weekends.

If seasonal or weekly variations exist in the area being modeled, specific unit diurnal curves should be developed for these periods using the same technique. Note that seasonal variations may also require an adjustment to the population data, such as during peak tourism, to accurately characterize seasonal variations in baseflow.

It is understood that flow-monitoring data will not be collected specifically for each individual sewer basin. For sewer basins that have not been individually monitored, diurnal curves shall be estimated based on diurnal curves from comparable basins with similar basin characteristics, particularly land use and area, using engineering judgment.

6.4.5 Rainfall Derived Inflow and Infiltration Generation

RDII generation techniques shall be limited to those which estimate the stormwater generated hydrograph, as described in this section. The modeler may use engineering judgment to select the RDII generation technique.

Note that some of these methods may not be available in all commercially available hydraulic modeling software. In order to apply a method not included in a given software package, sewer hydrographs will need to be developed outside of the software. Note that no method is more accurate or precise than the data, which are used to develop the RDII estimate.

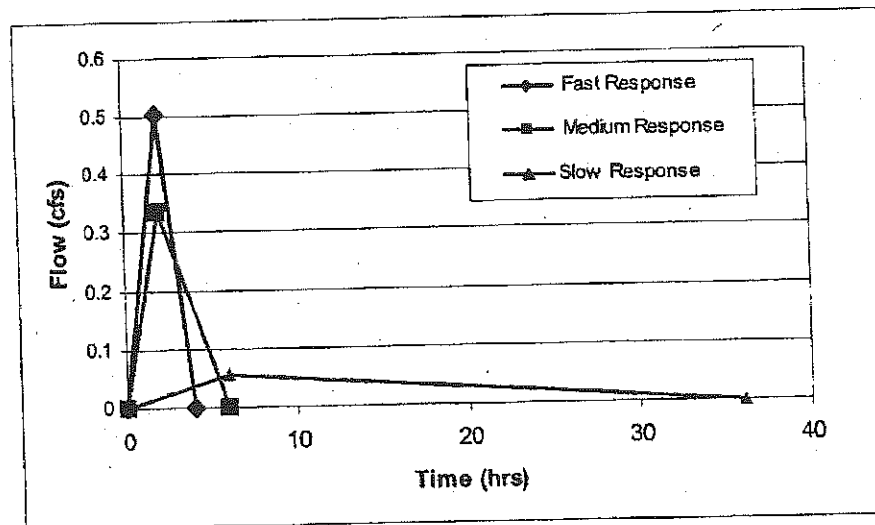
It is understood that flow-monitoring data will not be collected specifically for each individual sewer basin. For sewer basins that have not been individually monitored, RDII shall be predicted based on comparable results from monitored basins with similar basin characteristics using engineering judgment. The variables used to predict RDII shall be scaled as appropriate in non-monitored basins to develop proportional RDII as observed in the monitored basins of similar basin characteristics.

The modeler shall use engineering judgment when projecting RDII for future conditions. This assessment shall be made based on pipe age, condition, current versus future extent of sanitary sewer system, and experience.

RDII flow generated from models calibrated using a relatively short history of rainfall and flow records (i.e. less than the requirements in Section 3) should be used cautiously and more data should be collected to confirm the model results.

6.4.5.1 Synthetic Unit Hydrograph. This method follows a similar theory as used for developing unit hydrographs for stream hydrology. The shape of the unit hydrograph is a function of the basin's characteristics. Up to three unit hydrographs are commonly used to simulate the fast, medium and slow recession response of a sewer basin to rainfall as shown on Figure 6-4. Up to three unit hydrographs may be required to accurately predict RDII due to the fact that inflow and infiltration exhibit different responses to rainfall. Inflow typically exhibits a rapid reaction to rainfall while infiltration exhibits a more gradual response.

Figure 6-4. Synthetic Unit Hydrographs



6.4.5.2 Rainfall/Flow Regression. The rainfall/flow regression method develops a mathematical equation to relate rainfall and RDII. Once calibrated, this equation can be used to predict RDII quantities for selected rainfall events. This method requires a continuous (i.e., uninterrupted) history of both sewer flow and rainfall.

6.4.5.3 Hydrologic Methods. This technique simulates the hydrologic cycle including direct runoff, indirect inflow from sources such as foundation drains, ground water entry through system defects, and the impact of antecedent moisture conditions. Such methods, available in most commercial software, perform a mass balance on the rainfall, sewer flows and soil moisture to simulate RDII over all seasons and antecedent moisture conditions.

This RDII generation method can be made to match a measured flow hydrograph with a wide range of coefficient values; this may result in an inaccurate representation of RDII generation if these variables are adjusted improperly. Experience is needed to choose those parameter sets that will be most appropriate under different rainfall conditions.

6.4.5.4 RDII Prediction Components of Modeling Software. Most hydraulic modeling software includes methods for generating RDII based on parameters entered by the user. These may include one or more of the methods described earlier. Note that the software may use different terminology to describe these methods.

6.5 CALIBRATION AND VERIFICATION

6.5.1 Calibration

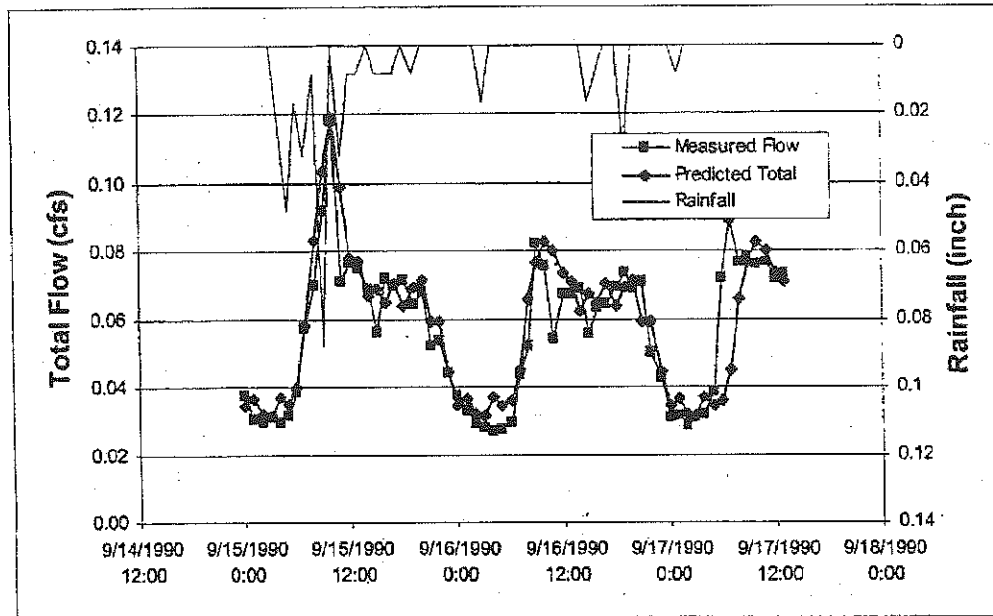
Calibration refers to the process of checking the predicted (modeled) flow against actual observed flow, given the rainfall conditions observed for the same period. This process includes double-checking initial input variables for reasonableness and adjustment of input variables. This process shall be followed by verification using a different set of data than was used for calibration.

The first step in model calibration is assuring network connectivity and boundary conditions (i.e. outlet conditions, pump control). Identification and correction of errors in network connectivity prior to variable adjustment will save labor during calibration.

Baseflow and RDII shall be treated as separate components during calibration. Baseflow shall be calibrated adequately before making adjustments to RDII. If baseflows were over predicted to match the total sewer flow, then the RDII would consequently be under predicted. This could produce gross inaccuracies in predicted flow, particularly in evaluation of future conditions when baseflows are extrapolated to account for population growth.

Adjustment of model variables can be guided by both graphical and statistical methods. During the initial iterations, it is convenient to use a graphical comparison of modeled and observed flow, as shown on Figure 6-5.

Figure 6-5. Modeled Versus Observed Flow



Graphing modeled and actual flows provides a quick analysis of model accuracy. This can be used early in calibration to identify large discrepancies and make broad adjustments to the model. Criteria for consideration during graphical analyses are hydrograph shape, peak flowrate, and peak and trough timing. This shall be applied to both baseflow and RDII.

Statistical methods provide quantitative comparisons to modeled and observed flows. Calibrated models shall meet the following statistical standards for dry and wet-weather flows. These standards will also be applied for model verification.

For dry-weather flow (i.e., baseflows), the following standards shall be met for calibration, in addition to matching general hydrograph shape. These standards shall be met for at least 2 dry-weather days.

- Predicted time of peaks and troughs shall be within 1 hour of the observed flow
- Predicted peak flowrate shall be within +/- 10 percent of the observed flow data
- Predicted volume of flow over 24-hours shall be within +/- 10 percent of observed flow

For wet-weather flow (baseflow and RDII), the following standards shall be met for calibration, in addition to matching general hydrograph shape. These standards are based on generally accepted practices, and conform to the guidance published in *Wastewater*

Planning Users Group (WaPUG) Code of Practice for the Hydraulic Modeling of Sewer Systems (2002). These standards are desirable for model calibration for the wet-weather events described in Section 3.3.3.

- Predicted time of peaks and troughs shall be within 1 hour of the observed flow
- Predicted peak flow rates shall be within -15 percent and +25 percent of the observed flow
- Predicted volume of the wet-weather event shall be within +20 percent and -10 percent of the observed flow
- Predicted pump discharge pressure within +/- 10% of observed pressures
- Predicted surcharge depth in manholes or other structures shall be within +1.5 feet and -0.3 feet of the observed depth
- Predicted non-surcharged water surface elevations shall be within +/- 0.3 feet of the observed depth

Other parameters may be used to ensure accurate calibration. These include, but are not limited to:

- Reasonable agreement between predicted and actual pumping station wet well level and discharge
- Accurate prediction of known overflow location and volume
- Accurate prediction of observed discharge pressure in force mains
- Accurate prediction of duration and volume of flow equalization/storage systems
- Representative performance of flow control structures such as weirs
- Adjustment of C-factors and roughness coefficients

If a model cannot meet the calibration criteria, the model may be considered sufficiently calibrated using engineering judgment if:

- The reason for non-compliance has been identified but cannot be modeled, and has been determined to be unimportant to the model's purpose and use. This shall be supported by credible evidence.
- The reason for the discrepancy cannot be identified, but an assessment of the effect of likely causes on the accuracy of the model has shown that this will not be detrimental to the use of the model.

6.5.2 Verification

Verification is the process of checking a model against data that were not used for calibration. The calibrated model is run with different rainfall data than those used in the calibration, and the results compared against corresponding flow data. Verification standards shall follow the same criteria used to evaluate the model during calibration. An overall quality review of the input data, network connectivity, assumptions, and simplifications shall be conducted during model verification.

In the event that a model does not meet the verification criteria, the cause of the situation shall be carefully reviewed. This situation may warrant inclusion of additional flow monitoring data in the analysis, field studies to determine system anomalies (e.g., heavy sediment accumulations) not included in the model, or revisiting the data input.

If a model cannot meet the verification criteria, the model may be considered sufficiently verified using engineering judgment if:

- The reason for non-compliance has been identified but cannot be modeled, and has been determined to be unimportant to the model's purpose and use. This shall be supported by credible evidence.
- The reason for the discrepancy cannot be identified, but an assessment of the effect of likely causes on the accuracy of the model has shown that this will not be detrimental to the use of the model.

6.6 LONG TERM FLOW SIMULATIONS

Long-term flow simulation shall be used to assess recurrence frequencies for peak flows or volumes. Specific recurrence frequencies are established using probabilistic analysis discussed in this section. Long-term flow simulation takes into account the range of historical antecedent rainfall patterns, and provides sufficient data with which to define the recurrence interval of peak flows.

Flow monitoring data may not be available for a sufficient period of record or for the location of interest to perform a probability analysis. Therefore, flow records may be synthetically generated using a calibrated model and a historic rainfall record. Generally, rainfall data is available for a much longer period of record than typically found in sewer flow monitoring.

Long-term flow simulation begins with the development of a calibrated model. Once a calibrated model has been developed, a long history of rainfall shall be applied to the model to generate a long-term history of sewer flows. The resulting modeled sewer flows provide an estimation of the actual sewer flows under the same rainfall conditions for the same period of record as the rainfall. Following the long-term simulation, the

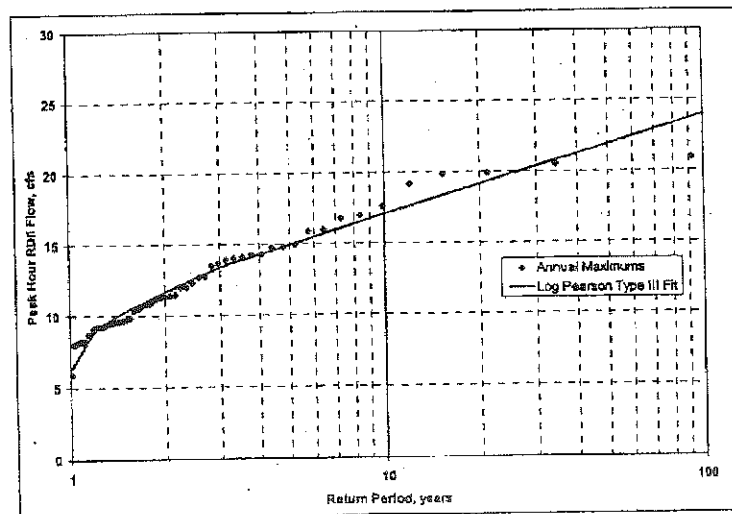
predicted sewer flow shall be subjected to probabilistic analysis to determine the recurrence interval for various events.

Any representative rainfall record for the area can be used for long-term simulation. To provide regional consistency, long-term historical rainfall data shall be used from the Norfolk International Airport (Airport Code ORF) for long-term simulations for the South Shore portion of the regional sanitary sewer system. Historical rainfall Data from the Newport News/Williamsburg International Airport (PHF) shall be used for the North Shore portion of the regional sanitary sewer system. The South Shore includes the portion of the regional sanitary sewer system south of the James River. The North Shore includes the regional sanitary sewer system to the north of the James River. Each of these rain gauge stations contains several decades of data, dating to the 1940s.

For event frequency analyses, the length of the rainfall record required shall be at least twice the frequency of the peak flow recurrence being evaluated. For example, to confidently predict the 5-year peak flow recurrence event would require 10-years of rainfall data.

Probabilistic analysis shall be used to determine event recurrence intervals and can be applied to both peak flow and volume. This method is detailed in most hydrology textbooks. Examples of probabilistic methods include Normal (Gaussian) distribution and Log-Pearson Type III distribution. An example of a peak flow probability graph is shown on Figure 6-6.

Figure 6-6. Example of Probability Plot



The peak flow recurrence frequency is based on long-term sewer flow data for the system (actual or synthesized data) that statistically represents the probability of achieving specific flow values. The peak flow recurrence frequency does not directly correlate to

the peak flow resulting from the same rainfall recurrence interval. For example, springtime rainfall events may have higher sewer flow volumes than would result from the same rainfall volume that occurs in summer due to differing soil moisture conditions and groundwater levels. A 2-year peak flow recurrence may occur during a 2-year, 24-hour rainfall event when soils are dry and groundwater is low, while the same sewer flow may be realized during a one-year 24-hour rainfall when the ground is saturated and the groundwater table is high. Resultantly, it is more accurate and defensible to utilize peak flow recurrence than rainfall recurrence as a basis for evaluating sanitary sewer system performance under wet-weather flow conditions.

6.7 HYDRAULIC MODEL DEVELOPMENT DOCUMENTATION

Modeling work shall be documented to support the model and the conclusions drawn from its use as well, as to provide a record for assessment the model's suitability for other projects.

Modeling documentation shall be developed which includes the following information:

- Model development, including data sources
- Model calibration and verification results

HRSD and the Localities shall develop model documentation for their respective models.

6.7.1 Model Development Documentation

This section of the model documentation shall document work from project inception through calibration, including:

- Project definition and purpose
- Data description, sources, reliability and location of data storage
- Assumptions and simplifications
- Naming conventions for manholes, pipes, structures, etc.
- Flow estimation methodology
- Calibration records including initial variable assumptions and justifications for variable adjustments outside of accepted ranges

The record of data shall be as specific as possible, referencing firm or agency of origin, date, format, modifications, and any commentary regarding data quality or assumptions about the data.

6.7.2 Model Verification Documentation

The purpose of the model verification section of the model documentation is to document the accuracy of the model against data other than that used for calibration. This section shall include:

- Metrics indicating the models compliance with verification standards
- Description and justification of changes to the model during verification
- Graphs comparing predicted to actual flow both for the verification period and the original calibration period
- Comments of the model's suitability for the intended use, particularly if the model does not meet one or more verification standards
- Analysis used to evaluate the suitability of a model not conforming to the verification standards
- Limitations of the model

SECTION 7 REHABILITATION PLANNING

7.1 PURPOSE

A Rehabilitation Plan shall be developed to address deficiencies identified in the SSES Basins; system-wide improvements including control of I/I sources; and improvements needed to ensure sustainability of the regional sanitary sewer system and protect water quality, human health, and the environment. Rehabilitation shall be considered the repair or replacement of existing sewer assets to restore or improve the performance of the regional sanitary sewer system. Correction of capacity deficiencies in the Regional Sanitary Sewer System up to, but not including, the Locality pump station that discharges directly to the HRSD system shall be addressed in the Rehabilitation Plan.

Factors to be considered in the development of the Rehabilitation Plan include:

- Location, cause and frequency of SSOs
- Structural condition of assets
- Hydraulic capacity of existing assets versus capacity needs (level of service requirement)
- I/I reduction potential
- Criticality of the pump station, sewer basin, or sewer
- Technical feasibility of rehabilitation
- Durability and useful life of various remedies
- Economic feasibility of rehabilitation
- Affordability of the Rehabilitation Plan in relation to the implementation schedule

The structural conditions of the assets shall be identified in the Condition Assessment documentation described in Section 4.8. The durability, useful life, and I/I mitigation effects of rehabilitation measures shall be considered when comparing asset repair versus asset replacement alternatives.

The criticality of individual assets shall be considered during the prioritization of projects in the Rehabilitation Plan. The prioritization shall consider the risk and consequence of failures that may be prevented or mitigated by each project. Projects that mitigate chronic SSOs and conditions leading to environmental, public health, or safety risks will be given the highest priority.

Consideration shall be given to the technical and economic feasibility of individual rehabilitation projects, particularly with regard to I/I reduction. In cases where rehabilitation or replacement is not projected to reduce peak flow to within the peak flow threshold, an alternatives analysis shall be conducted cooperatively between the Locality

and HRSD to identify cost-effective capacity enhancements. Such enhancements shall be included as part of the Regional Wet Weather Management Plan described in Section 8. The construction of capital improvements and modified operational schemes to increase the capacity of the regional sanitary sewer system and manage peak flows shall be coordinated between the Locality responsible for the improvement and HRSD.

7.2 GOALS

The goals of the Rehabilitation Plan are to:

- Prevent SSOs by addressing localized significant defects and bottlenecks in the sanitary sewer system
- Reduce I/I and thereby peak flows
- Ensure sustainability of the infrastructure assets by addressing identified deficiencies
- Identify means and methods to remedy the problems
- Establish prioritization of rehabilitation efforts for inclusion in the Locality's Capital Improvement Program

7.3 I/I REDUCTION APPROACH

Engineering judgment should be used to estimate the percent I/I that can be removed within an SSES Basin based on observed defects, general pipe/manhole condition, material of construction, and estimated I/I contributions within the sanitary sewer system exclusive of contributions from private sanitary sewer connections. Consideration shall be given to the "fluid" nature of the I/I sources, particularly if rehabilitation is limited to specific components in the total system. A common error in estimating the effectiveness of rehabilitation is to assume net sewer service area effects will be equal to the sum of the I/I values initially allocated to specific rehabilitation components. Rehabilitation in one area can result in raising the groundwater level, increasing leakage in previously adequate sewers because of increased hydraulic head. Historically, peak flows represent a surcharge condition, in which rehabilitation efforts will not register any overall reduction until peak flows have been reduced below the capacity of the limiting conveyance segment of the surcharged section. Understanding the effectiveness of the sewer rehabilitation I/I control program is essential to making the right decisions regarding rehabilitation versus increasing conveyance capacity. Additional guidance information may be found in the WEF Manual of Practice FD-06 – *"Existing Sewer Evaluation and Rehabilitation"*, and WERF Publication 99-WWF-8 – *"Reducing Peak Rainfall Derived Infiltration/Inflow Rates – Case Studies and Protocols"*

Various rehabilitation and replacement methods have differing levels of effectiveness, maintenance impacts and life spans. These variations should be considered when evaluating the costs and benefits of alternatives.

For each SSES Basin, the Locality shall assess the cost and feasibility of using rehabilitation to reach the Peak Flow Threshold Criteria. The estimated peak flow in the basin (as determined per the procedures outlined in Section 6) associated with a 10-year rainfall recurrence interval shall be compared to the Peak Flow Threshold Criteria. One of the following two outcomes of this analysis shall be identified:

1. If the projected peak flow in the SSES Basin exceeds the Peak Flow Threshold Criteria under current development conditions, the Locality shall assess the cost and feasibility of reaching the Peak Flow Threshold. If after appropriate analysis and collaboration with HRSD, the Locality deems that it is not cost-effective and/or it is not feasible to achieve the Peak Flow Threshold in a particular SSES Basin, the Locality shall develop costs, and estimate the reduced peak flow levels that can be achieved, for the planned level of rehabilitation in that SSES Basin. Any SSES Basins in which the planned rehabilitation is estimated not to reach the Peak Flow Threshold must be addressed within the Regional Wet Weather Management Plan.
2. If the projected peak flow in the SSES Basin is less than the Peak Flow Threshold Criteria then the Locality shall develop a rehabilitation plan to correct significant defects and reduce I/I to the extent that is cost effective and feasible. The Rehabilitation Plan will provide for the cost, schedule and estimated peak flow resultant from the rehabilitation.

In any case, the Locality shall make an affirmative commitment, which will be relied upon in the RWWMP in terms of post rehabilitation peak flow in all SSES Basins at the specified level of service. All costs developed in the Rehabilitation Plan shall be stated in the dollar value in the year the plan is submitted.

7.4 PRIORITIZATION OF PROBLEMS AND IDENTIFIED DEFECTS

The prioritization of significant defects is needed in order to develop a plan to systematically reduce I/I, and ultimately reduce SSOs, that occur in the system. The prioritization shall focus on the most severe defects and areas with the majority of SSO occurrences. In addition, there are several other factors that need to be considered when working through the prioritization. Items to consider when prioritizing rehabilitation activities include:

- Number and severity of system defects
- Number of SSOs that could be avoided if the system were rehabilitated
- Operation and maintenance history and costs
- Quantity of I/I entering the system and potential for I/I reduction
- Probability and consequence of failure of the sanitary sewer system
- Available capacity
- Estimated cost of the proposed rehabilitation

- Technical complexity of the rehabilitation activities and potential secondary impacts

A ranking system shall be developed that accounts for factors that influence the prioritization of system improvements. Individual utilities may weight the criteria differently and/or may add additional criteria based on their need and desired priorities. In any case, the prioritization shall consider the above criteria as a minimum.

7.5 REHABILITATION ALTERNATIVES EVALUATION

Alternative approaches to rehabilitation shall be considered in the development of the Rehabilitation Plan. This may include rehabilitation, capacity upgrades, flow diversions, and/or replacement. Key factors in deciding a rehabilitation method for various facilities will include the: structural condition, mechanical condition, capacity requirements, type of material, accessibility, conflicting utilities and other facilities, extent of repair needed, remaining useful life and cost of rehabilitation or replacement.

7.5.1 Rehabilitation vs. Replacement

It will be necessary to determine if failing portions of the system can be rehabilitated or if they will require replacement. Factors affecting this decision include:

- Available capacity
- Structural condition
- Remaining useful life
- Estimated rehabilitation effectiveness
- Future needs
- Change in system functionality or operation
- Pipe slope
- Restoration requirements
- Cost

7.5.2 Methods of Rehabilitation

Several technologies are available for consideration in developing the Rehabilitation Plan, and new technologies are routinely emerging in the sanitary sewer industry. The Rehabilitation Plan shall consider the application of commonly used rehabilitation and replacement methods, advantages and limitations of the technique. The full range of available rehabilitation methods should be considered at the time the Locality develops the Rehabilitation Plan as described in Section 7.6.

7.6 REHABILITATION PLAN

7.6.1 Rehabilitation Plan and Schedule

Rehabilitation Plans shall be developed to define specific measures that will be taken to reduce SSOs, the cost associated with the proposed rehabilitation, and the planned timeframe for rehabilitation activities. The Rehabilitation Plan shall be submitted to DEQ for review and approval within 62 months of the effective date of the Consent Order. In addition, each Locality shall submit their estimated post rehabilitation peak flows to the Regional Wet Weather Management Planning Group, which will rely upon these in the completion of the RWWMP.

7.6.2 Report on Work Completed

Progress on rehabilitation projects that are implemented between the execution date of the Special Order by Consent and the submittal of the Rehabilitation Plan shall be described in the Annual Report to DEQ.

SECTION 8 REGIONAL WET WEATHER MANAGEMENT PLAN DEVELOPMENT

8.1 BACKGROUND AND PURPOSE

HRSD and the Hampton Roads Localities are entering into a collaborative process to address sanitary sewer overflows (SSOs). One component of this challenge is the provision of adequate capacity to collect, convey and treat peak flows in the Regional Sanitary Sewer System during wet weather. HRSD owns, operates and maintains the backbone infrastructure generally consisting of pump stations, pressure reducing stations, interceptors and treatment works for the region. The Localities generally own, operate and maintain sanitary sewer facilities that collect and convey wastewater to HRSD. During some wet weather conditions, facilities owned by the Localities and HRSD are strained to convey peak flows without experiencing SSOs.

The purpose of the Regional Wet Weather Management Plan (RWWMP) is to define improvements in the Regional Sanitary Sewer System necessary to achieve a mutually agreed upon level of service. Procedures are identified in Section 6 for evaluating the hydraulic performance assessment of the Regional Sanitary Sewer System under a range of hydrologic conditions. The hydraulic performance assessment will identify hydraulic deficiencies for each condition analyzed. This output will be used as input to the RWWMP.

Three types of improvements shall be defined and analyzed:

- Large scale strategies to address major systemic hydraulic deficiencies
- Improvements to the pump stations, force mains, sewer mains and interceptors
- Improvements needed to ensure adequate capacity in SSES Basins where the Locality's or HRSD's individual Rehabilitation Plans are not expected to reduce the peak flow at the agreed upon level of service to within the Peak Flow Threshold.

Alternatives for addressing the hydraulic deficiencies will be developed and analyzed. Cost, feasibility, operations and maintenance issues, risk, performance, flexibility and local impacts will be considered in the analysis of alternatives. The preferred set of alternatives necessary to achieve the mutually agreed upon level of service will be identified along with their associated costs and implementation schedule.

During the process of actually providing and rehabilitating needed infrastructure, operational considerations shall be analyzed and coordinated between HRSD and the localities to help reduce the effects of high I/I and in turn reduce associated overflows where possible.

8.2 CAPACITY ASSESSMENT

HRSD and the Localities shall develop and document capacity assessments that describe the conclusions regarding capacity deficiencies and hydraulic performance of the Regional Sanitary Sewer System. Conclusions shall include, but not be limited to identification of areas that do not have adequate capacity, as defined in Section 2, to manage peak flows under the following conditions:

- Baseline dry weather flows, current conditions and 2030 population
- 2-year peak flow recurrence, current conditions and 2030 population
- 5-year peak flow recurrence, current conditions and 2030 population
- 10-year peak flow recurrence, current conditions and 2030 population

Operational and structural conditions contributing to capacity deficiencies shall also be identified. If a sewer basin is deemed to have adequate capacity under the 10-year peak flow recurrence conditions, additional analysis at lower levels of service may not be required. Any conclusions shall be supported by the modeling output (e.g. graphs, surcharge depths, peak flow), or other appropriate data.

8.3 LEVEL OF SERVICE SELECTION

A key concept in development of the RWWMP is establishing a level of service that will form the basis for planning capacity enhancements. Level of service in this context is defined as the peak sewer flow that the Regional Sanitary Sewer System can convey without resulting in a capacity-related SSO. Level of service in the RWWMP shall be quantified as a peak sewer flow recurrence interval.

Level of service equates to risk of system failure. For example, a sewer that performs at a 2-year level of service would have a probability of overflows being 50% in any given year; at a 10-year level of service, the probability of overflows would be 10% in any given year. The probability of overflow can be estimated based on monitoring and analysis of the flowrate and level of flow in a wastewater collection system, and through analysis of the SSO history. The cost of providing a 10-year level of service (or protection against overflows) is generally significantly greater than providing a 2-year level of service. The cost of service and risk of overflows are inversely proportional.

The costs, benefits and risks associated with achieving various levels of service for the defined capacity enhancements shall be defined in the RWWMP. These costs, benefits and risks shall be analyzed to reach a consensus on the selected level of service. The selected level of service will generally apply across the Regional Sanitary Sewer System although exceptions may be possible on a case by case basis provided that these can be adequately justified by their associated benefits and risks.

8.4 DEVELOPMENT OF CAPACITY ENHANCEMENT SOLUTIONS

After a level of service is selected, alternatives to achieve that level of service will be developed and analyzed in order to optimize the solutions needed to ensure adequate capacity. Alternatives shall be developed to address the capacity deficiencies identified per Section 8.2. These alternatives shall consider approaches such as removal of RDII, providing additional hydraulic capacity to convey and treat peak flows, storage options, operational schemes, and satellite treatment. These approaches can be used alone and/or in combination and should follow the Operating Guidelines set forth in Exhibit B. The life cycle costs, constructability, operations and maintenance impacts, water quality benefits, local impacts and risks associated with each alternative shall be described.

8.5 AFFORDABILITY

An affordability analysis shall be conducted for the selected plan with the results to be used as input to the development of an implementation schedule. The affordability analysis shall use a multifaceted approach which describes affordability in terms of such factors as total annual wastewater costs as a function of median household income, Localities' financial capability, total annual wastewater costs as a function of household income for vulnerable populations, impacts to homeownership and renter housing cost burden and impacts to the local economy and business health. The purpose of the affordability analysis is to provide input to the development of an implementation schedule, which will result in an affordable program for the Hampton Roads region.

8.6 RWWMP CONTENT

The following is a preliminary outline describing the anticipated content of the RWWMP. This outline is intended to provide general guidance for the preparation of the RWWMP. It is anticipated that some deviation from this outline will occur in the development of the RWWMP.

1. Introduction

1.1 Background

1.2 Purpose and Format of Regional Wet Weather Management Plan

2. Consent Order Requirements

3. Public Participation and Agency Coordination

4. Characterization Report

4.1 Sanitary Sewer System

4.1.1 Localities Sanitary Sewer Systems

- 4.1.2 HRSD Sanitary Sewer System
- 4.1.3 Service Areas
- 4.1.4 Historical Wastewater Flow Projections
- 4.2 HRSD Wastewater Treatment Works
 - 4.2.1 North Shore Facilities
 - 4.2.2 South Shore Facilities
- 5. Planning Process**
 - 5.1 Methodology
 - 5.1.1 Large Scale Strategies
 - 5.1.2 SSES Basins
 - 5.1.3 Wastewater Treatment Plant Wet Weather Optimization
 - 5.2 Sewer System Capacity Definitions
- 6. Population Forecasts**
 - 6.1 Planning Horizon
 - 6.2 Population and Employment Forecasts
- 7. System Evaluation**
 - 7.1 Model Framework
 - 7.1.1 Dry Weather Flow
 - 7.1.2 Wet Weather Flow
 - 7.1.3 Peak Flow Reductions Expected from Localities' Rehabilitation Plans
 - 7.1.4 Capacity Deficiencies
 - 7.1.4.1 Deficiencies in the Regional Sanitary Sewer System
 - 7.1.4.2 Deficiencies at the WWTPs
 - 7.1.5 Modeled Conditions
 - 7.2 Evaluation of Pump Stations, Main Trunk Sewers and Interceptors
 - 7.2.1 Pump Stations, Main Trunk Sewers/Interceptors Studied
 - 7.2.2 Level of Service Evaluation
 - 7.2.3 Peak Flow Events
 - 7.2.4 Methodology
 - 7.2.5 Identification of Hydraulic Deficiencies
 - 7.3 Wastewater Treatment Plants
 - 7.3.1 Historical Flow Data
 - 7.3.2 Evaluation for Extreme Events
 - 7.3.2.1 Selection of Historical Events
 - 7.3.2.2 Projecting to Future Conditions
 - 7.3.2.3 Recurrence Frequency Analysis
 - 7.4 SSES Basins Not Meeting Peak Flow Threshold
 - 7.4.1 Methodology
 - 7.4.2 Evaluation

8. Development and Evaluation of Capacity Enhancement Solutions

8.1 Large Scale Strategy Alternatives Evaluation and Selection

8.1.1 North Shore

8.1.2 South Shore

8.2 Pump Stations, Main Trunk Sewers/Interceptors

8.2.1 Analysis of 2, 5 and 10 year LOS

8.2.2 LOS Selection for Pump Stations, Trunk Sewer/Interceptors

8.3 SSES Basins Not Meeting Peak Flow Threshold

8.3.1 Mitigation Options

8.3.1.1 RDII Abatement Options

8.3.1.2 Operational Alternatives

8.3.1.3 Conveyance Options

8.3.1.4 Storage Options

8.3.1.5 Satellite Treatment

8.3.2 Alternatives Analysis and Plan Selection

9. Wastewater Treatment Plant Alternatives

9.1 Hydraulic Assessment

9.1.1 North Shore

9.1.2 South Shore

9.2 Process Assessment

9.2.1 North Shore

9.2.2 South Shore

10. Optimization of Wet Weather Improvements

10.1 Description of Large Scale Strategy Alternatives

10.2 Sizing the Alternatives

10.3 Scoring Alternatives

10.3.1 Cost

10.3.2 Constructability

10.3.3 Operations and Maintenance

10.3.4 Water Quality

10.3.5 Local Impacts

10.3.6 Risks

10.4 Selection of the Preferred Alternatives

11. Summary of Wet Weather Management Plan Components

11.1 Overview

11.2 Capital Improvement Plans

11.3 Operating Plans

11.4 Program Summary

12. Cost Analysis, Implementation Schedule and Risk/Benefit Analysis

- 12.1 Program Overview
- 12.2 Risk/Benefit Analysis
- 12.3 Affordability Analysis
- 12.4 Prioritization of Improvements
- 12.5 Implementation Schedule
- 12.6 Operating Plans

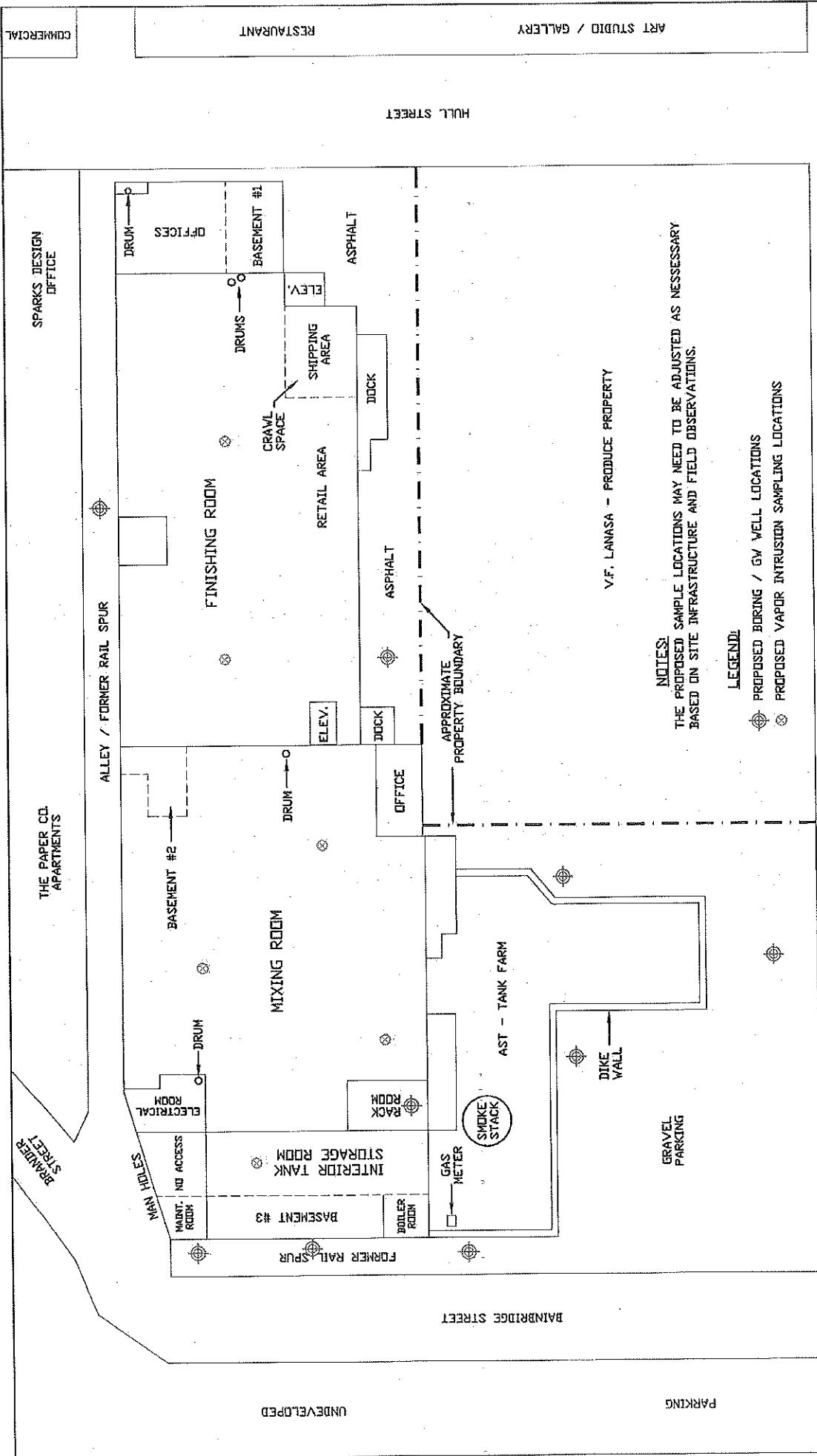
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E. 4TH STREET

FORMER REYNOLD'S - "F" BUILDING SITE

FORMER REYNOLD'S - "F" BUILDING SITE

SAMPSON COATINGS, INC. - 301 HULL STREET
RICHMOND, VIRGINIA

PROPOSED PHASE II - SAMPLE LOCATIONS

PROJECT # 29614	DATE: 03/13/15	DESIGN BY: AWM	CLIENT: CLACHAN ACQUISITIONS
APPROVED BY: VFM	DWG # 129614-4	DRAWN BY: AWM	SCALE: NOT TO SCALE

FIGURE 1

COMMONWEALTH ENVIRONMENTAL ASSOCIATES, INC.
7411 IRON BRIDGE ROAD, RICHMOND, VIRGINIA 23237

NOTES:
THE MAP IS NOT TO SCALE.
THE MAP IS BASED ON FIELD OBSERVATIONS.
ALL SITE INFRASTRUCTURE OR INDIVIDUAL ROOMS ARE NOT INDICATED ON THE MAP.
PROPOSED LOCATIONS MAY NEED TO BE FIELD ADJUSTED BASED ON SITE CONDITIONS.

EXHIBIT A - REGIONAL DESIGN GUIDELINES

HRSD and the Hampton Roads Localities agree to develop a Regional Wet Weather Management Plan that will define improvements in the Localities' and HRSD's systems necessary to manage peak wet weather flows. The design capacity and system performance data required to develop the Wet Weather Management Plan (flow monitoring, SCADA data, system mapping, calibrated hydraulic models, etc.) will be developed through fulfillment of the consent order requirements in accordance with mutually agreed upon regional standards. The Regional Wet Weather Management Plan will analyze system performance for existing and future peak flows under a range of hydrologic conditions, define improvements necessary to achieve mutually acceptable level of service and establish an implementation schedule for constructing those improvements. It is anticipated that completing the improvements is a long-term endeavor.

In the interim, as part of the consent order obligations, HRSD and the Localities will be conducting sewer system evaluations in their individual systems to identify and characterize sources of infiltration and inflow (I/I). This inspection work will be information based utilizing system performance data to focus on those areas that contribute the most extraneous flow. The results of the inspection program will be used to develop and implement prioritized rehabilitation plans focused on reducing peak flows. Corrective actions will include short term, high gain activities (i.e., removal of areas drains, installing manhole inserts and clean out caps, minor point repairs), where appropriate, to reduce inflow. Other more substantial rehabilitation efforts (such as pipe replacement or lining) will be implemented in accordance with a schedule to be determined as an output of the consent order.

Until the Regional Wet Weather Management Plan is complete, design of any new or enhanced major sewer infrastructure (i.e., regional pump stations, major interceptors, etc.) must anticipate the future performance standards that will result from the outputs of the consent order. HRSD agrees to revisit its design standard for interceptors that may be designed and constructed prior to the Regional Wet Weather Management Plan.

The regional design standards will be based on the following assumptions:

- Peak hourly residential wastewater flow of 250 gallons per capita per day at an assumed 3.1 persons per household, or 775 gallons per residential unit per day; plus
- Peak hourly commercial/industrial wastewater flow will be based on actual flow if available or 3 times the average projected water consumption if not available
- The relationship of peak water consumption and peak wastewater is assumed to be: 3 X water consumption = 2.5 X wastewater flow

HRSD, the Hampton Roads Localities and DEQ agree to adopt these standards for design.

EXHIBIT B - REGIONAL SANITARY SEWER SYSTEM OPERATING GUIDELINES

1. Introduction

- a. HRSD interceptor systems, HRSD treatment plants, and locality wastewater systems are interdependent and must be designed and operated as a system using similar design and operating guidelines to provide efficient cost effective and reliable service. This document details the operating guidelines for the Regional Sanitary Sewer System.
- b. These operating guidelines are intended to be practical, prudent and based on the needs of all components of the Regional Sanitary Sewer System.
- c. These Operating Guidelines are in accordance with the Sewage Collection and Treatment (SCAT) Regulations established by the Department of Environmental Quality.
- d. A cooperative and coordinated effort among HRSD and the Localities involving the sharing of information and collective decision making on matters that extend beyond the respective individual systems will help ensure the Regional Sanitary Sewer System will provide the needed wastewater services cost effectively and that water quality is protected.

2. Operating Flow

- a. Facilities designed and constructed in accordance with the Regional Design Guidelines are not intended to be used for the transport of high levels of I/I.
- b. The difference between the operating flow (3 times water consumption) and the design flow is capacity intended for growth and buffer. This buffer will enable portions of the HRSD system to accommodate some level of I/I without having overflows while the responsible locality is working to decrease the amount of I/I. This buffer will also allow time for HRSD to construct additional capacity if needed.
- c. When actual measured peak hourly flows at HRSD Master Meter sites exceed Operating Flow during a 10-year peak flow recurrence event, HRSD will evaluate its sanitary sewer capacity based on the Regional Design Guidelines. When actual measured peak hourly flows at HRSD Master Meter sites or at locality meter sites exceed the Regional Design Guidelines for hydraulic capacity, HRSD along with the affected localities will evaluate their systems. In both cases, HRSD and the affected localities will jointly determine the appropriate course of action.

3. Operating Pressure

- a. The HRSD pressure policy is one criterion for the design and operation of regional sanitary sewer system facilities. The HRSD pressure policy is based in part on the operating elevation of the treatment plants. The operating elevation is described in the

Exhibit B - Regional Sanitary Sewer System Operating Guidelines

Development Plan (Section 5-Interceptor System Policies, Paragraph 5.2-Sizing of Facilities) as the centerline elevation of a plant influent pressure reducing station suction line plus ten feet or the maximum design water surface elevation of a treatment plant as appropriate. (*Development Plan 2000*, HRSD, 2003.) This elevation plus 65 feet then determines the maximum energy gradeline for each plant system.

- b. The HRSD pressure policy provides a standard for the maximum pressure conditions to be expected in the HRSD interceptor systems. The actual operating pressures in the interceptor systems under most circumstances will be lower than indicated by the HRSD pressure policy due to low flow conditions, lack of future planned growth, diurnal flow variations, operation of other pump stations along common force mains, and/or operation of pressure reducing stations. However, operating pressures may increase to the level indicated by the HRSD pressure policy due to peak flow conditions, growth, flow diversions, and/or changes in operation of intermediate pressure reducing stations.
- c. The HRSD operating pressure may present design and operating challenges for localities due to the varying pressure conditions between low flow and peak flow conditions. HRSD will operate its Pressure Reducing Stations (PRSs) in a variable speed mode to help maintain pressures within as uniform a band as possible. Changes to operations in the HRSD system shall be coordinated with the affected localities. The Regional Sanitary Sewer System shall be designed to be easily modified over time as required to meet changing pressure conditions.
- d. The HRSD pressure policy is dependant upon proper coordination between the localities and HRSD operations. Recognizing that additional flows within the Regional Sanitary Sewer System will increase pressures, pump station modifications should be coordinated with HRSD and all affected localities.

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement ("Agreement") is entered into and is effective on this 22nd day of JUNE, 2007, by and among the Hampton Roads Sanitation District ("HRSD"); the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the Town of Smithfield; and the counties of Gloucester, Isle of Wight, and York; and the James City Service Authority (each a "Locality" and collectively, the "Localities"); and the Hampton Roads Planning District Commission ("HRPDC").

WHEREAS, HRSD provides wastewater transmission and treatment services for the Localities.

WHEREAS, the Localities individually own and operate sanitary sewer collection systems, which collect sewage within their individual jurisdictional boundaries and deliver it to the HRSD sewer system for treatment.

WHEREAS, although individually owned and operated, these sewage collection and treatment systems are physically interconnected at numerous locations to form a regional system serving a population of over 1.6 million.

WHEREAS, the cities, counties and towns of the Hampton Roads region have established the HRPDC pursuant to Section 15.2-4200 of the Code of Virginia. Among its responsibilities, the HRPDC is charged with regional planning and coordination among the Localities. At the request of the Localities, the HRPDC is facilitating and coordinating discussions among HRSD and the Localities related to the collection and treatment of sewage.

WHEREAS, due to pipe breaks, electrical outages, wet weather events, insufficient capacity in the collection, interceptor and treatment systems, and other factors, untreated sewage is, on occasion, discharged from various locations in the HRSD sewer system and the individual sanitary sewer collection systems of the Localities.

WHEREAS, for many years, HRSD and the Localities have worked diligently and spent tens of millions of dollars testing and making repairs and improvements to their respective systems to minimize, and, where possible, prevent discharges of untreated sewage. These efforts notwithstanding, however, discharges of untreated sewage occasionally occur from the HRSD sewer system and from the individual sanitary sewer collection systems of the Localities. Accordingly, HRSD and the Localities have agreed to expand their efforts to include measures that are designed to address both the regional and individual sanitary sewer collection system capacity and performance conditions that continue to cause or contribute to discharges of untreated sewage.

WHEREAS, HRSD and the Localities have agreed to a two-phased initiative to address these matters. The first phase is principally a data collection, evaluation and plan development program that consists of both regional and individual elements. The regional element will require the use of uniform standards to identify the infrastructure projects needed to provide the collection system, interceptor system and treatment capacity required to cost-effectively manage peak wet weather flows throughout the Regional Sanitary Sewer System. The individual element is designed to identify, characterize, and cost-effectively address conditions that cause or contribute to discharges of untreated sewage. This element is also intended to provide for system repairs that require prompt attention. This first phase will be reflected in a special order by consent to be issued by the State Water Control Board ("Board") to HRSD and, with the exception of Norfolk, the Localities ("Regional Order").

WHEREAS, the second phase of the Initiative will provide for the implementation of long-term capacity enhancement and sewer rehabilitation plans, including construction of the regional infrastructure projects and individual system improvements identified in the first phase.

WHEREAS, the City of Norfolk ("Norfolk") and HRSD have together already entered into two successive special orders by consent ("Norfolk/HRSD Orders") with the Board. Pursuant to the Norfolk/HRSD Orders, Norfolk has already completed much of the work associated with the individual element of the first phase described above and is now implementing its individual capital improvements and operational measures that are contemplated as part of the second phase described above. Although Norfolk and HRSD anticipate completing their respective individual elements of the initiative pursuant to the Norfolk/HRSD Orders, they will be participating in the regional element of both the first and second phases of the initiative.

WHEREAS, the City of Hampton ("Hampton") and HRSD have already entered into a special order by consent ("Hampton/HRSD Order") with the Board pursuant to which Hampton and HRSD have already completed a portion of the work associated with the individual elements of the first phase described above. Hampton and HRSD anticipate that their respective uncompleted individual elements called for under the Hampton/HRSD Order will be merged into the Regional Order, that the Hampton/HRSD Order will be terminated at the time the Regional Order is issued, and that any such respective uncompleted individual elements merged into the Regional Order and also their respective regional elements of the first and second phases of the initiative will be completed pursuant to the Regional Order.

WHEREAS, to facilitate a coordinated regional approach to the operation and maintenance of their individual systems and to establish a consistent and uniform framework for identifying and implementing regional and individual

system improvements, HRSD and the Localities have developed Regional Technical Standards, which are attached to this Agreement as Attachment A.

WHEREAS, HRSD and the Localities also understand and agree that the work and activities required to minimize the potential for discharges of untreated sewage can be efficiently implemented to achieve the most cost-effective solutions only through a coordinated effort involving the sharing of information and a cooperative approach to decision making on matters that extend beyond their individual systems.

NOW, THEREFORE, in consideration of the mutual covenants and obligations contained herein, HRSD and the Localities (each a "Utility" and collectively "the Utilities") and the HRPDC do hereby agree to enter into this Agreement for the purpose of defining the roles, responsibilities, and obligations of the Utilities and HRPDC; establishing procedures for the sharing of data and information between and among the Utilities providing for compliance with the Regional Technical Standards; and establishing procedures to be followed by the Utilities to request modifications to the Regional Order and the Regional Technical Standards; and for resolving disputes between and among the Utilities related to the matters addressed herein.

A. DEFINITIONS

"Board" means the State Water Control Board, a permanent citizens body of the Commonwealth of Virginia as described in Virginia Code §§ 62.1-44.7 and 10.1-1184.

"Committee" means the HRPDC Directors of Utilities Committee, the membership of which consists of the utility department directors (or their designees) for all the Localities and the General Manager of HRSD (or his or her designee).

"Current Norfolk/HRSD Order" means the special order by consent dated March 17, 2005 by and among the Board, the City of Norfolk, and HRSD.

"DEQ" means the Department of Environmental Quality, an agency of the Commonwealth of Virginia as described in Virginia Code §10.1-1183.

"EPA" means the United States Environmental Protection Agency.

"Hampton/HRSD Order" means the special order by consent dated October 15, 2002 by and among the Board, the City of Hampton, and HRSD.

"Norfolk/HRSD Orders" means the special orders by consent dated December 17, 2001 and March 17, 2005 by and among the Board, the City of Norfolk, and HRSD.

"Party" or "Parties" means one or more signatories to this Agreement.

"Regional Order" means the special order by consent dated____, 2007 by and among the Board and the Utilities.

"Regional Sanitary Sewer System" means the collective sanitary sewer systems owned and operated by the Localities, as well as the HRSD sanitary sewer system including gravity sewer lines, manholes, pump stations, lift stations, pressure reducing stations, force mains, wastewater treatment plants, and all associated appurtenances.

"Regional Technical Standards" means the standards developed and agreed to by HRSD and the Localities to facilitate a coordinated regional approach to the operation and maintenance of their individual systems and to establish a consistent and uniform framework for identifying and implementing regional and individual system improvements. The Regional Technical Standards consist of the following: (1) regional design guidelines, (2) sewer system evaluation studies (SSES), (3) data collection and flow monitoring, (4) hydraulic modeling and performance assessment, (5) regional operating guidelines, (6) sewer system condition assessment, (7) rehabilitation planning, and (8) other technical requirements.

B. STATEMENT OF PRINCIPLES

This Agreement is based upon the following principles:

1. While the Utilities are individually responsible for operating, maintaining, and improving their respective systems, they have a shared responsibility and mutual interest in ensuring that their individual systems function effectively and efficiently as an integral part of a larger regional system.

2. A cooperative and coordinated effort among the Utilities involving, among other things, the sharing of data and information, development and implementation of regional technical standards and collective decision-making on matters that extend beyond respective individual systems, will help to ensure that the region's sewage collection and treatment needs are served cost effectively and that water quality is protected.

3. Each of the Utilities should operate, maintain, expand, and improve their individual systems with the objective of providing efficient and cost-effective service to their respective residents and ratepayers while not adversely affecting the service provided by or to any other Utility.

4. The cost of identifying and implementing the regional system enhancements required to improve system performance and thereby reduce the

occurrence of un-permitted discharges should be shared equitably among the Utilities and shall be minimized to the degree practicable for the overall lowest cost to the ratepayers of the region.

5. In the interest of regional cooperation, the Utilities should seek to resolve their differences through dispute resolution before resorting to administrative or judicial remedies.

C. ROLES AND RESPONSIBILITIES

In addition to such other obligations as may be established in this Agreement, the Parties shall have the following roles and responsibilities:

1. HRPDC. The HRPDC will (a) provide, as needed, staffing coordination support for the Committee related to Committee functions, including related subcommittees and workgroups, set forth herein, including but not limited to arranging and conducting periodic meetings of the Committee to review and discuss status of the work and activities required by the Regional Order and related issues, (b) serve to coordinate the making and delivery of notices among the Utilities as set forth herein, and (c) select any mediators needed to facilitate dispute resolution under this Agreement.

2. HRPDC Directors of Utilities Committee. The Committee will coordinate and facilitate the multi-jurisdictional related work and activities required by the Regional Order and organize subcommittees or work groups as may be needed to address and resolve issues. The Counties of Southampton and Surry and the Cities of Franklin and Norfolk are members of the Committee, but are not parties to the Regional Order or this Agreement. Therefore, they have no rights or responsibilities under this Agreement.

3. HRSD. HRSD will maintain active participation in the Committee's activities pursuant to this Agreement; maintain and make available to the Committee or the Localities and HRPDC such data, information, or notifications as they may need to fulfill their responsibilities and obligations under the Regional Order and this Agreement; consult with the Localities in the preparation of the plan and schedule for the installation of flow and pressure meters and rainfall gauges required by subparagraph 1(a) of Appendix A of the Regional Order; assist the Localities in the performance of their individual SSESs; and cooperate with the Localities in the development of the Regional Wet Weather Management Plan required by the Regional Order.

4. Localities. Each Locality will maintain active participation in the Committee's activities pursuant to this Agreement; maintain and make available to the Committee, HRSD, other Localities and HRPDC such data, information, or notifications as they may need to fulfill their responsibilities and obligations under the Regional Order and this Agreement; consult with HRSD and the other

Localities in the preparation of the plan and schedule for the installation of flow and pressure meters and rainfall gauges required by subparagraph 1(a) of Appendix A of the Regional Order; and cooperate with HRSD and the other Localities in the development of the Regional Wet Weather Management Plan required by the Regional Order.

D. COMPLIANCE WITH REGIONAL TECHNICAL STANDARDS AND DEVELOPMENT AND IMPLEMENTATION OF REGIONAL WET WEATHER MANAGEMENT PLAN

Each Utility agrees to:

1. Comply with the Regional Technical Standards, which are attached as Attachment A (Attachment 1 to the Regional Order) and hereby incorporated into this Agreement.

2. In cooperation with the other Utilities, jointly develop, and on or before December 31, 2013 (or such other date as may be approved by the Board or the DEQ) submit to the DEQ for approval, a final Regional Wet Weather Management Plan as described in Section D.3 of the Regional Order. In conjunction therewith, HRSD will perform those tasks listed in Paragraphs 1 and 2 of Appendix A of the Regional Order, and each Locality will perform those tasks listed in paragraphs 4 and 5 of its respective Appendix of the Regional Order.

3. Upon approval of the Regional Wet Weather Management Plan by the DEQ and all of the Utilities, comply with the Regional Wet Weather Management Plan.

E. PROPOSED MODIFICATIONS TO THE REGIONAL ORDER AND THE REGIONAL TECHNICAL STANDARDS

1. Proposed Modifications to Section D.3 and D.4 of the Regional Order.

(a) Any Utility wishing to modify either Section D.3 or Section D.4 of the Regional Order will give at least 30 days prior written notice of the proposed modification to the other Utilities pursuant to the notice procedures of Section G.6 below before requesting the Board or DEQ to make such modification. Such notice shall describe the proposed modification and the basis and justification for such modification.

(b) Within 30 days of receiving notice of the proposed modification, every other Utility will file, pursuant to the notice procedures of Section G.6 below, its written response to the notice setting forth either (i) its consent to the proposed modification or (ii) its objection to the proposed modification and the basis for such objection. Any Utility may receive a 30-day

extension to respond by so notifying the other Utilities in writing prior to the expiration of the response time period. Failure to respond by filing a written consent or objection within the prescribed time period as set forth herein shall be deemed to be consent to the proposed modification.

(c) The Utility proposing the modification may proceed to request the Board or DEQ to modify the Regional Order as proposed only if all the Utilities have consented (or be deemed to have consented pursuant to Section E.1. (b) above) to the proposed modification.

(d) Within 60 days after receiving from HRPDC one or more notices of objection to the proposed modification, the Utilities will meet as needed to resolve the objection through informal negotiations. At the request of a majority of the Utilities, the HRPDC shall employ a mediator to assist in resolving the dispute. The cost of any such mediator shall be shared equally by those engaged in the mediation process.

(e) If the dispute can not be resolved and the consent of all the Utilities can not be secured within 120 days of all other Utilities receiving notice of the objection, the Utility proposing the modification will withdraw the proposal and provide written notice of such withdrawal pursuant to Section G.6 below; provided, however, that the 120-day resolution period may be extended upon consent of all of the Utilities.

2. Proposed Modifications to Appendices to Regional Order. Any Utility that is a party to the Regional Order may request the Board or DEQ to modify its individual obligations in an Appendix to the Regional Order. The Utility making such a request shall provide every other Utility with a copy of its request at the time such request is filed with the Board or DEQ, as well as a copy of the Board's or DEQ's response to said request.

3. Modifications to Regional Technical Standards. The Regional Technical Standards may be modified only with the consent of all the Utilities.

F. REMEDIES AND RESERVATIONS OF RIGHTS

1. If any Utility shall fail to perform or observe any of the material terms, conditions or provisions of this Agreement applicable to it, and said failure is not rectified or cured within 30 days after receipt of written notice thereof from another Utility, then the defaulting Utility shall be deemed in breach of this Agreement; provided, however, that no Utility shall have a right to issue a notice of default pursuant to this Section F.1, until the dispute resolution procedures set forth in Section F.2 below have been exhausted. The Parties agree that, in the event of a material breach of this Agreement, a non-defaulting Utility which is or would be harmed by the breach may be permitted to seek injunctive relief or specific performance of the defaulting Utility's obligations without the requirement

to post a bond. The Parties acknowledge that each Utility's performance of its material obligations is valuable and unique and that, for purposes of allowing the non-defaulting Utility to seek injunctive relief, the failure of a Utility to perform its material obligations hereunder may result in irreparable injury to the other Utilities. Nothing in this Agreement shall be deemed to modify, alter or otherwise affect such other rights and remedies as may be available to the Utilities under applicable law or equity. HRPDC shall have no rights to seek enforcement of this Agreement.

2. If any dispute arises with respect to the alleged failure of any Utility to perform or observe any of the material terms, conditions or provisions of this Agreement applicable to it, a Utility may initiate the dispute resolution procedures of this Section F.2 by providing to the other Utilities written notice of the existence and nature of the dispute. Within 30 days of such notice, the parties to the dispute shall meet and attempt in good faith to resolve the dispute. Upon the request of any party to the dispute, the parties to the dispute shall participate in mediation. In the event of mediation, the mediator shall be selected by HRPDC and the cost of the mediator shall be shared equally by those parties engaged in the mediation. If the dispute can not be resolved within 60 days after receipt of written notice of the dispute, then any party to the dispute may elect to end dispute resolution by providing written notice of such election to the other parties to the dispute, in which case the dispute resolution procedures shall be deemed to have been exhausted. The dispute resolution procedures may also be deemed exhausted by written agreement of all the parties to the dispute.

3. Nothing herein shall be construed as or otherwise constitute a waiver or release by any Party of any right, power, immunity or standing of that Party that may exist pursuant to applicable law or regulation, including, without limitation, such right or standing to appeal or seek review of any case decision or other reviewable determination of the Board, DEQ, EPA, or any other agency or governmental body related to the matters addressed in this Agreement, the Regional Order, the Current Norfolk/HRSD Order, or the Hampton/HRSD Order.

G. MISCELLANEOUS

1. Amendments to Agreement. Amendments to this Agreement must be in writing and signed by all the Parties. No amendment may be inconsistent with the provisions of the Regional Order.

2. Entire Agreement. Subject to the requirements of the Regional Order, the Current Norfolk/HRSD Orders, and the Hampton/HRSD Order, this Agreement contains the entire agreement among the Parties with respect to the subject matter hereof and supersedes all prior agreements, written or oral, with respect thereto.

3. Severability. If any provision of this Agreement is found to be unenforceable, the remainder of this Agreement shall remain in full force and effect.

4. Authority. The Parties represent that they have the authority to enter into this Agreement and that the individuals signing this Agreement on their behalf have the requisite power and authority to bind the Parties to its terms and conditions. This Agreement shall apply to, and be binding upon the Parties, their elected officials, officers, agents, employees, successors and assigns.

5. Reservation. Except as expressly provided herein, nothing in this Agreement shall be construed to limit or otherwise affect the authority, rights, or responsibilities of the Parties.

6. Notices and Written Communications. All notices and written communication pursuant to this Agreement shall be submitted to the following HRPDC contact by electronic mail, recognized overnight courier or other hand delivery, or postage-prepaid U.S. Mail:

Deputy Executive Director, Physical Planning
Hampton Roads Planning District Commission
723 Woodlake Drive
Chesapeake, Virginia 23320
(757) 420-8300
jcarlock@hrpdc.org

HRPDC will promptly forward any such notice or written communication to all of the Committee members on behalf of the Utilities in the same manner as the notice or written communication was received by HRPDC. Notices shall be deemed received by the Utilities on the day of actual receipt from the HRPDC unless such day is not a Business Day, in which case such notice shall be deemed to have been received on the next Business Day. A Business Day for purposes of this Section G.6 shall mean any calendar day, ending at 4:30 P.M., that is not a Saturday, Sunday or official State or national holiday.

7. Term. This Agreement shall be effective on _____ and shall continue in effect until terminated by agreement of the Parties. In no event, however, shall this Agreement be terminated while the Regional Order remains in effect.

8. Governing Law. This Agreement shall be governed and construed in accordance with the laws of the Commonwealth of Virginia, without regard to the conflict of laws and rules thereof.

9. Force Majeure. No Party shall be responsible for its failure to fulfill an obligation pursuant to this Agreement to the extent that such failure is due to

acts of God; strikes; war or terrorism; the actions of a third party; the actions of another Party; lockouts; or other events not reasonably within the control of the Party claiming *force majeure*. A Party experiencing a *force majeure* event, which prevents fulfillment of a material obligation hereunder, shall (i) give the other Parties prompt written notice describing the particulars of the event; (ii) suspend performance only to the extent and for the duration that is reasonably required by the *force majeure* event; (iii) use reasonable efforts to overcome or mitigate the effects of such occurrence; and (iv) promptly resume performance of the affected obligation if and when such Party is able to do so.

10. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original as against any Party whose signature appears thereon, and all of which shall together constitute one and the same instrument. This Agreement shall become binding when one or more counterparts hereof, individually or taken together, shall bear the signatures given on behalf of all of the parties reflected hereon as the signatories.

11. Not for Benefit of Third Parties. This Agreement and each and every provision hereof is for the exclusive benefit of the Parties and not for the benefit of any third party.

12. Binding Effect. This Agreement shall inure to the benefit of the Parties and shall, to the extent permitted by law, be binding on the Parties and their successors and assigns.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized officials as of the dates next to their respective signatures as shown below.

[REST OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

HAMPTON ROADS SANITATION DISTRICT

By: WASIM

Date: 6/14/07

Date: 6-14-07

Attest: Jennifer Heilman

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF CHESAPEAKE

By: 

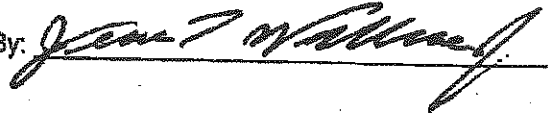
Date: 6/20/07

Date: 6/20/07

Attest: 
City Clerk

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF HAMPTON

By: 

Date: 6/26/07

Date: 6/26/07


Attest: 
Clerk of Council

Approved as to Legal Sufficiency:


Chief Deputy City Attorney

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF NEWPORT NEWS

By: 
City Manager

Date: June 25, 2007

Date: June 26, 2007

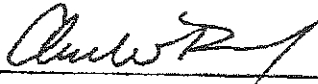
Attest: 
City Clerk

REVIEWED BY:


Senior Assistant City Attorney

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF POQUOSON

By: 

Date: June 15, 2007

Date: June 15, 2007

Attest: 

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF PORTSMOUTH

By: 

Date: 6-18-07

Date: 6-18-07

Attest: Beverly W. Pennie

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF SUFFOLK

By: _____

James G. Vacalis

James G. Vacalis, City Manager

Date: _____

6/27/07

Date: _____

June 27, 2007

Attest: _____

Erika S. Dawley

Erika S. Dawley, City Clerk

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF VIRGINIA BEACH

By: James K. Spore

Date: June 28, 2007

Date: 28 June 2007

Attest: Ruth Hodges Fraser, MMC

Approved as to Content:

Jim Leahy III
Department of Public Utilities

Approved at Legal Sufficiency:

William M. Macchi
City Attorney's Office

COMMONWEALTH OF VIRGINIA
CITY OF VIRGINIA BEACH, to wit:

The foregoing instrument was acknowledged before me this 28th day of June, 2007, by James K Spore, City Manager, and Ruth Hodges Fraser, MMC, City Clerk, on behalf of the City of Virginia Beach.

MT Byhyia
Notary Public

My Commission Expires: August 31, 2008

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

CITY OF WILLIAMSBURG

By: 
Jackson C. Tuttle

Date: June 15, 2007

Date: June 15, 2007

Attest: 
Shelia Y. Crist

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

TOWN OF SMITHFIELD

By: Paul S. Miller

Date: 6/5/2007

6/5/2007
Date: Sharon L. Thomas

Attest: _____

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

GLOUCESTER COUNTY

By: Wm. H.

Date: 6/14/07

Date: June 14, 2007

Attest: Dale J. Burrell

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the Executive Director of the Hampton Roads Planning District Commission and the General Manager of the Hampton Roads Sanitation District hereby execute this Agreement.

ISLE OF WIGHT COUNTY

By: W. Douglas Caskey
W. Douglas Caskey, County Administrator

Date: June 14, 2007

Attest:

Carey Mills Storm
Carey Mills Storm, Clerk

Approved as to form:

A. Paul Burton
A. Paul Burton, Interim County Attorney

IN WITNESS THEREOF, the Chief Administrative Officer of the local government, the General Manager of the Hampton Roads Sanitation District and the Executive Director of the Hampton Roads Planning District Commission hereby execute this Agreement.

YORK COUNTY

By: _____

Date: _____

6-18-09
NCN #176618

Date: _____

Attest: _____

Mary C. Swimmer

Attachment 3



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219

Mailing address: P.O. Box 1105, Richmond, Virginia 23218

www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

STATE WATER CONTROL BOARD ENFORCEMENT ACTION - ORDER BY CONSENT ISSUED TO

the cities of CHESAPEAKE, HAMPTON, NEWPORT NEWS, NORFOLK, POQUOSON, PORTSMOUTH, SUFFOLK, VIRGINIA BEACH, and WILLIAMSBURG; the counties of GLOUCESTER, ISLE OF WIGHT, and YORK; the JAMES CITY SERVICE AUTHORITY; and the town of SMITHFIELD

SECTION A: Purpose

This is a Consent Order issued under the authority of Va. Code § 62.1-44.15, between the State Water Control Board and the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the counties of Gloucester, Isle of Wight, and York; the James City Service Authority; and the town of Smithfield (the "Localities" collectively or "Locality" separately) for the purpose of resolving certain violations of the State Water Control Law and the applicable regulation and to supersede and cancel those certain Orders by Consent between the Board, the Hampton Roads Sanitation District (HRSD) and the Localities.

SECTION B: Definitions

Unless the context clearly indicates otherwise, the following words and terms have the meaning assigned to them below:

1. "Board" means the State Water Control Board, a permanent citizens' board of the Commonwealth of Virginia, as described in Va. Code §§ 10.1-1184 and 62.1-44.7.
2. "Department" or "DEQ" means the Department of Environmental Quality, an agency of the Commonwealth of Virginia, as described in Va. Code § 10.1-1183.
3. "Director" means the Director of the Department of Environmental Quality, as described in Va. Code § 10.1-1185.
4. "Discharge" means discharge of a pollutant. 9 VAC 25-31-10

5. "Discharge of a pollutant" when used with reference to the requirements of the VPDES permit program means:
- (a) Any addition of any pollutant or combination of pollutants to surface waters from any point source; or
 - (b) Any addition of any pollutant or combination of pollutants to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.
6. "HRSD" means the Hampton Roads Sanitation District, a political subdivision created by a 1940 Act of the General Assembly of Virginia and charged with the responsibility to provide sewage treatment services for the communities in the Hampton Roads metropolitan area. HRSD is a "person" within the meaning of Va. Code §62.1-44.3.
7. "MOM" means management, operations, and maintenance.
8. "Order" means this document, also known as a "Consent Order" or "Order by Consent," a type of Special Order under the State Water Control Law.
9. "Pollutant" means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 USC § 2011 *et seq.*)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. 9 VAC 25-31-10
10. "Pollution" means such alteration of the physical, chemical, or biological properties of any state waters as will or is likely to create a nuisance or render such waters (a) harmful or detrimental or injurious to the public health, safety, or welfare or to the health of animals, fish, or aquatic life; (b) unsuitable with reasonable treatment for use as present or possible future sources of public water supply; or (c) unsuitable for recreational, commercial, industrial, agricultural, or other reasonable uses, provided that (i) an alteration of the physical, chemical, or biological property of state waters or a discharge or deposit of sewage, industrial wastes or other wastes to state waters by any owner which by itself is not sufficient to cause pollution but which, in combination with such alteration of or discharge or deposit to state waters by other owners, is sufficient to cause pollution; (ii) the discharge of untreated sewage by any owner into state waters; and (iii) contributing to the contravention of standards of water quality duly established by the Board, are "pollution." Va. Code § 62.1-44.3
11. "Regulation" means the VPDES Permit Regulation, 9 VAC 25-31-10 *et seq.*
12. "Sanitary sewer collection system" or "Facility" means those sewer assets individually owned by a Locality.

13. "Significant Defect" means a physical condition in the sanitary sewer collection system, including (i) existing or imminent structural failures, cave-ins, and similar defects and (ii) significant sources of inflow and infiltration (including but not limited to missing and/or damaged public clean-outs, missing manhole inserts, direct storm water connections, and unsealed manhole pipe penetrations).
14. "State Water Control Law" means Chapter 3.1 (§ 62.1-44.2 *et seq.*) of Title 62.1 of the Va. Code.
15. "State waters" means all water, on the surface and under the ground, wholly or partially within or bordering the Commonwealth or within its jurisdiction, including wetlands. Va. Code § 62.1-44.3
16. "STP" means sewage treatment plant.
17. "TRO" means the Tidewater Regional Office of DEQ, located in Virginia Beach, Virginia.
18. "Va. Code" means the Code of Virginia (1950), as amended.
19. "VAC" means the Virginia Administrative Code.
20. "VPDES" means Virginia Pollutant Discharge Elimination System.

SECTION C: Findings of Fact and Conclusions of Law

1. HRSD owns and operates an interceptor sewer system, which includes both gravity and force mains, and nine (9) STPs, which serve the Hampton Roads area (HRSD System). Discharges of treated wastewater from the STPs into State waters are regulated by VPDES permits issued by the Board.
2. The Localities individually own and operate sanitary sewer collection systems which collect sewage within their individual jurisdictional boundaries and deliver it to the HRSD System for treatment.
3. Due to pipe breaks, electrical outages, infiltration and inflow, insufficient capacity in the collection, interceptor and treatment systems, and other factors, untreated sewage has been and is being discharged from various locations in the individual sanitary sewer collection systems of the Localities and HRSD to various state waters in the area. The low-lying nature of the Hampton Roads region and corresponding high groundwater table, together with periodic widespread flooding in the region's urbanized areas, are significant factors contributing to the discharge of untreated sewage.
4. Infiltration and inflow due to system age, damage by contractors working in public rights-of-way, grease, and limited root intrusion problems have historically resulted in instances of backups, malfunction or rupture, resulting in overflows of untreated sewage from various locations in the Norfolk sanitary sewer collection system and the HRSD System.

5. Section 62.1-44.5.A of the Code and the Regulation at 9 VAC 25-31-50.A prohibit the discharge of sewage to state waters except as authorized by a permit issued by the Board. The Board has not issued the Localities permits authorizing said discharges of untreated sewage. Accordingly, the Board finds that the Localities have violated Va. Code § 62.1-44.5.A and 9 VAC 25-31-50.A.
6. Notwithstanding the foregoing, the City of Norfolk entered into two Orders by Consent with HRSD and the Board effective December 17, 2001 and March 17, 2005. The 2001 Consent Order comprehensively addressed sanitary sewer overflows by requiring development of collection system plans, expenditure of \$13.5 million on capital improvements and system operation, and completion of a Sanitary Sewer Evaluation Survey and a gravity line inspection program in the City of Norfolk. The 2005 Consent Order required HRSD and Norfolk to, among other things, address wet weather issues in the City of Norfolk with a Long Term Control Plan requiring a minimum annual investment in sewer infrastructure. Norfolk has invested over \$100 million in the Norfolk System and is in compliance with the prior Consent Orders.
7. To address the unpermitted discharge of sewage due to wet weather occurrences, the Board entered into an Order by Consent with HRSD and the Localities (excluding Norfolk) effective September 26, 2007. This Order by Consent, as amended, requires that HRSD and the Localities (excluding Norfolk) jointly develop a Regional Wet Weather Management Plan ("RWWMP") that identifies, quantifies, prioritizes, and proposes a schedule for implementing regional sewer system enhancements among other things.
8. To address regional wet weather sewer capacity requirements, on February 23, 2010, HRSD, DEQ, and the United States Environmental Protection Agency entered into a Federal Consent Decree. The Federal Consent Decree requires, among other things, that HRSD work in consultation with the Localities (excluding Norfolk) to develop a RWWMP that will ensure adequate wet weather sewer capacity in HRSD's portion of the regional sewer system.
9. During the ongoing planning for the RWWMP, HRSD and the Localities researched the most cost effective and practical means for development and implementation of the RWWMP. The studies resulted in unanimous support of an alternate regionalization approach whereby HRSD would take responsibility for regional wet weather capacity. Under this approach, HRSD will assume sole responsibility for drafting, funding, and implementing the RWWMP without assuming ownership of Locality sewer system assets. The approach was formally adopted by all the Localities and HRSD through a regional Memorandum of Agreement dated March 10, 2014. The Memorandum of Agreement creates mutually enforceable obligations by and between HRSD and each of the Localities to facilitate the agreed-upon regionalization approach. The Memorandum of Agreement and HRSD's Federal Consent Decree work in conjunction with this Order by Consent to form a coordinated regional approach to providing and maintaining regional wet weather capacity.

10. On August 26, 2014, the United States Environmental Protection Agency amended the Federal Consent Decree to reflect the alternate regionalization plan specifying HRSD's responsibility to develop, fund and implement the RWWMP.
11. As the responsibility for the RWWMP has been transferred to HRSD solely, the RWWMP requirements and conditions contained in the Order by Consent, as amended, are no longer applicable to the Localities.
12. Proper management, operation, and maintenance of sanitary sewer infrastructure must continue to be conducted by Localities to prevent dry weather unpermitted sanitary sewer overflows and to ensure compliance with the referenced statutory and regulatory provisions. Under their 2001 and 2005 Consent Orders, Norfolk developed a collection system (i.e. a MOM) plan, which was accepted by DEQ and implemented. Pursuant to the 2007 Order by Consent, the Localities (excluding Norfolk) developed MOM plans for DEQ approval and implementation. This order serves to formalize the Localities' commitment to continue to implement and follow their accepted and/or approved, individual MOM programs.

SECTION D: Agreement and Order

By virtue of the authority granted it in Va. Code § 62.1-44.15, the Board orders each Locality, and each Locality agrees from the effective date of this Order forward, to implement a MOM program designed to maintain and operate Locality-owned collection system assets in accordance with industry-accepted practices relating to sewer inspection, evaluation and repair of Significant Defects (not scheduled to be addressed by the RWWMP and excluding those for which HRSD is responsible pursuant to the Federal Consent Decree as amended) and that at minimum includes the parameters described in Appendix A of this Order. The MOM program must document the MOM program elements used to manage each Locality's sewer system and minimize unpermitted sanitary sewer overflows. The MOM program shall include a sanitary sewer overflow response plan and quantifiable parameters for assessing program implementation. Throughout the life of the MOM program, a meaningful set of enforceable quantitative performance measures must be maintained. Performance assessment measures may be added, deleted, and/or modified if such revision results in a better assessment of the performance and effectiveness of the MOM program.

The Board and the Localities understand and agree that the requirements in this Order are the individual obligations of each party named in the Order, and no party shall be liable for noncompliance of another party with the requirements of this Order. Further the Board and the Localities understand and agree that this Order supersedes and terminates the Order by Consent issued by the Board on September 26, 2007, December 17, 2001 and March 17, 2005.

SECTION E: Administrative Provisions

1. The Board may modify, rewrite, or amend this Order with the consent of the Localities for good cause shown by the Localities, or on its own motion pursuant to the Administrative Process Act, Va. Code § 2.2-4000 *et seq.*, after notice and opportunity to be heard.

2. This Order addresses and resolves all system overflows and releases from the sewer systems owned by the Localities and known or reported to the DEQ up to the date of execution of this Order by the Localities. This Order shall not preclude the Board or the Director from taking any action authorized by law, including but not limited to: (a) taking any action authorized by law regarding any additional, subsequent, or subsequently discovered violations; (b) seeking subsequent remediation of the facility; or (c) taking subsequent action to enforce the Order.
3. For purposes of this Order and subsequent actions with respect to this Order only, the Localities admit to the jurisdictional allegations, and agree not to contest, but neither admit nor deny the findings of fact and conclusions of law in this Order.
4. The Localities consent to venue in the Circuit Court of the City of Richmond for any civil action taken to enforce the terms of this Order.
5. The Localities declare they have received fair and due process under the Administrative Process Act and the State Water Control Law and waive the right to any hearing or other administrative proceeding authorized or required by law or regulation, and to any judicial review of any issue of fact or law contained herein. Nothing herein shall be construed as a waiver of the right to any administrative proceeding for, or to judicial review of, any action taken by the Board to modify, rewrite, amend, or enforce this Order.
6. Failure by any Locality to comply with its respective individual obligations under the terms of this Order shall constitute a violation of an order of the Board by the party who fails to comply. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of additional orders as appropriate by the Board or the Director as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority. The Localities do not waive any rights or objections they may have in any enforcement action by other federal, state, or local authorities arising out of the same or similar facts to those recited in this Order.
7. If any provision of this Order is found to be unenforceable for any reason, the remainder of the Order shall remain in full force and effect.
8. The Localities shall be responsible for failure to comply with their individual obligations under this Order unless compliance is made impossible by earthquake, flood, other acts of God, war, strike, or such other unforeseeable circumstances beyond their control and not due to a lack of good faith or diligence on their part. The Locality claiming this defense shall demonstrate that such circumstances were beyond its control and not due to a lack of good faith or diligence on its part. The Locality shall notify the DEQ Regional Director verbally within 24 hours and in writing within three business days when circumstances are anticipated to occur, are occurring, or have occurred that may delay compliance or cause noncompliance with any requirement of the Order. Such notice shall set forth:

- a. the reasons for the delay or noncompliance;
 - b. the projected duration of any such delay or noncompliance;
 - c. the measures taken and to be taken to prevent or minimize such delay or noncompliance; and
 - d. the timetable by which such measures will be implemented and the date full compliance will be achieved.
9. Failure to so notify the Regional Director verbally within 24 hours and in writing within three business days, of learning of any condition above, which the parties intend to assert will result in the impossibility of compliance, shall constitute a waiver of any claim to inability to comply with a requirement of this Order.
10. This Order is binding on the parties hereto and any successors in interest, designees and assigns, jointly and severally.
11. This Order shall become effective upon execution by both the Director or his designee and the Localities.
12. This Order shall continue in effect until:
- a. The Director or his designee terminates the Order after the Localities have completed all of the requirements of the Order;
 - b. The Localities petition the Director or his designee to terminate the Order after they have completed all of the requirements of the Order and the Director or his designee approves the termination of the Order; or
 - c. The Director or Board terminates the Order in his or its sole discretion upon thirty (30) days' written notice to the Localities.
13. Termination of this Order, or any obligation imposed in this Order, shall not operate to relieve each Locality from its obligation to comply with any statute, regulation, permit condition, other order, certificate, certification, standard, or requirement otherwise applicable.
14. The undersigned representative of each Locality certifies that he or she is a responsible official authorized to enter into the terms and conditions of this Order and to execute and legally bind the Locality to this document. Any documents to be submitted pursuant to this Order shall also be submitted by a responsible official of the Locality.
15. This Order constitutes the entire agreement and understanding of the parties concerning settlement of the violations identified in Section C of this Order; and there are no representations, warranties, covenants, terms or conditions agreed upon between the parties other than those expressed in this Order.

By their signatures below, the Localities voluntarily agrees to the issuance of this Order.

And it is so ORDERED this 19 day of December, 2014.



Maria Nold, Regional Director
Department of Environmental Quality

----- (Remainder of Page Intentionally Blank) -----

The terms and conditions of the Order are voluntarily accepted by:

Date: 10/22/14

By: [Signature]
City Manager

Commonwealth of Virginia
City of Chesapeake

The foregoing instrument was acknowledged before me this 22 day of October, ²⁰¹⁴ by
James E. Baker, City Manager, on behalf of the City of Chesapeake.

Wanda B. Futrell
Notary Public

My commission expires: 30 September 2015



Wanda B. Futrell
Commonwealth of Virginia
Notary Public
ID #188712

The terms and conditions of the Order are voluntarily accepted by:

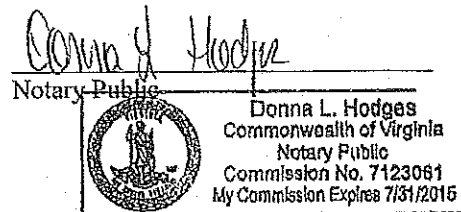
Date: 10/23/14

By: Mary B. Bunting
City Manager/ Authorized Designee

Commonwealth of Virginia
City of Hampton

The foregoing instrument was acknowledged before me this 23rd day of October, 2014, by
Mary B. Bunting, City Manager or Authorized Designee, on behalf of the City of Hampton.
She/He is known to me personally.

My commission expires: July 31, 2015
Registration No. 7123061



ATTEST:

[Signature]
Clerk of Council

CITY OF HAMPTON
OFFICE OF THE CITY ATTORNEY
Approved as to legal form and sufficiency
Date: 10.09.2014
[Signature]
Attorney

The terms and conditions of the Order are voluntarily accepted by:

Date: 10-6-14

By:

James M. Bourey
City Manager

Commonwealth of Virginia
City of Newport News

The foregoing instrument was acknowledged before me this 6th day of October by
James M. Bourey, City Manager, on behalf of the City of Newport News.

James D. Walker
Notary Public

My commission expires: 03/31/2018

ATTEST:

APPROVED AS TO FORM:

Mabel Washington Jenkins
City Clerk

[Signature]
Deputy City Attorney

The terms and conditions of the Order are voluntarily accepted by:

Date: 10/22/14

By:

Marcus Jones
City Manager

Commonwealth of Virginia
City of Norfolk

The foregoing instrument was acknowledged before me this 22 day of Oct. by
Marcus Jones City Manager, on behalf of the City of Norfolk.

Tracey Cox Hasick
Notary Public

My commission expires:

4/30/18



ORIGINAL

The terms and conditions of the Order are voluntarily accepted by:

Date: 10/15/2014

By:

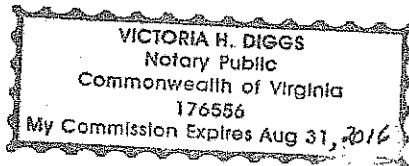
James F. Wheeler
City Manager

Commonwealth of Virginia
City of Poquoson

The foregoing instrument was acknowledged before me this 15th day of October by
J. Randall Wheeler, City Manager, on behalf of the City of Poquoson.

Victoria H. Diggs
Notary Public

My commission expires: 8-31-2016



The terms and conditions of the Order are voluntarily accepted by:

Date: Oct 22, 2014

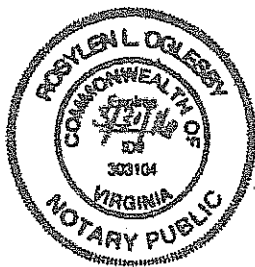
By: John L. Rome, Jr.
City Manager

Commonwealth of Virginia
City of Portsmouth

The foregoing instrument was acknowledged before me this 22 day of Oct. by
John L. Rome, Jr., City Manager, on behalf of the City of Portsmouth.

Roxley L. Oglesby
Notary Public

My commission expires:



The terms and conditions of the Order are voluntarily accepted by:

Date: 10/24/14

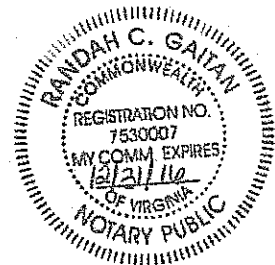
By: *Deena Cuffee*
City Manager

Commonwealth of Virginia
City of Suffolk

The foregoing instrument was acknowledged before me this 24th day of October by
Deena Cuffee - Glenn City Manager, on behalf of the City of Suffolk.

Randah C. Gaitan
Notary Public

My commission expires:



The terms and conditions of the Order are voluntarily accepted by:

Date: OCTOBER 8, 2014

By: James K. Spore

City Manager

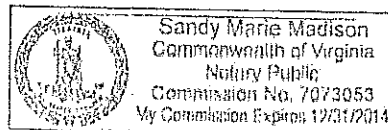
Commonwealth of Virginia
City of Virginia Beach

The foregoing instrument was acknowledged before me this 9th day of Oct by
James K. Spore, City Manager, on behalf of the City of Virginia Beach.

Sandy Marie Madison
Notary Public

My commission expires:

12.31.14
7073053



APPROVED AS TO CONTENT:

APPROVED AS TO LEGAL SUFFICIENCY:

Thomas M. Leahy III
Department of Public Utilities

William M. Macaluso
City Attorney's Office

The terms and conditions of the Order are voluntarily accepted by:

Date: 10/12/2014

By: [Signature]

City Manager

Commonwealth of Virginia
City of Williamsburg

The foregoing instrument was acknowledged before me this 18th day of Oct by
JACKSON C. TUTTLE, City Manager, on behalf of the City of Williamsburg.



[Signature]
Notary Public

My commission expires: 2/28/2018

The terms and conditions of the Order are voluntarily accepted by:

Date: Oct 10, 2014

By:

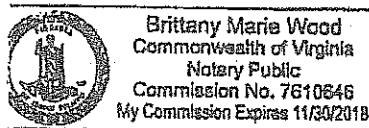
Brenda G. Garton
County Administrator

Commonwealth of Virginia
County of Gloucester

The foregoing instrument was acknowledged before me this 10th day of October by
Brenda G. Garton, County Administrator, on behalf of the County of Gloucester.

[Signature]
Notary Public

My commission expires: 11-30-2018



The terms and conditions of the Order are voluntarily accepted by:

Date: 10-16-14

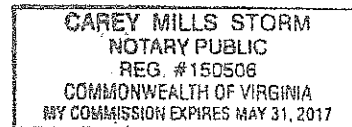
By: [Signature]
County Administrator

Commonwealth of Virginia
County of Isle of Wight

The foregoing instrument was acknowledged before me this 16th day of October, 2014 by
Anne A. Seward County Administrator, on behalf of the County of Isle of Wight.

[Signature]
Notary Public

My commission expires: May 31, 2017



The terms and conditions of the Order are voluntarily accepted by:

Date: October 22, 2014

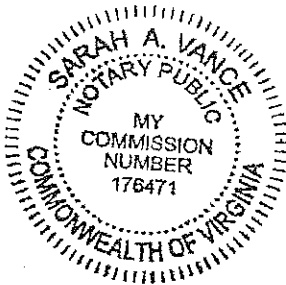
By: [Signature]
Intervenor County Administrator

Commonwealth of Virginia
County of York

The foregoing instrument was acknowledged before me this 22 day of October
2014, County Administrator, on behalf of the County of York.

[Signature]
Notary Public

My commission expires: 12-31-2016



Approved as to form:
[Signature]
County Attorney

The terms and conditions of the Order are voluntarily accepted by:

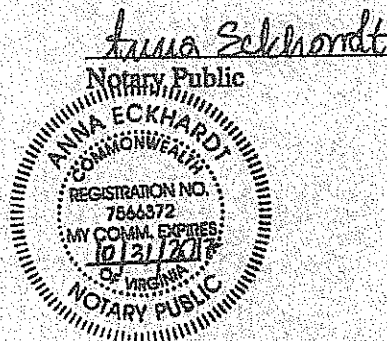
Date: 10/28/2014

By: M. D. Poken
General Manager

Commonwealth of Virginia
James City Service Authority

The foregoing instrument was acknowledged before me this 28 day of OCTOBER by
M. DOUGLAS POKEN, General Manager, on behalf of the James City Service Authority.

My commission expires: 10/31/2017



The terms and conditions of the Order are voluntarily accepted by:

Date: 10/08/2014

By:

P. M. Stephenson
Town Manager

Commonwealth of Virginia
Town of Smithfield

The foregoing instrument was acknowledged before me this 8th day of Oct. by
Peter M. Stephenson, Town Manager, on behalf of the Town of Smithfield.



My commission expires 11/21/16

Lesley J. Greer
Notary Public

APPENDIX A

MOM Program

The following are guidelines that provide the minimum components to be included in a MOM Program:

1. Major program goals

- a. Proper management, operation, and maintenance of the collections system over which you have operational control,
- b. Stop/reduce and mitigate the impact of SSO in the portion of the collection system over which you have operational control,
- c. Providing notification to parties with a reasonable potential for exposure to pollutants associated with SSO events.

2. Organization

- a. Administrative and maintenance positions responsible for implementing measures in the MOM program, including lines of authority by organization chart or similar documents
- b. The chain of communication for reporting SSOs

3. Legal Authority (i.e., sewer use ordinances, service agreements or other legally binding documents)

- a. List legal authority to control infiltration and connections from inflow sources
- b. List legal authority that requires that sewers and connections be properly designed and constructed
- c. List legal authority to ensure proper installation, testing, and inspection of new and rehabilitated sewers (collector lines or service laterals)

4. Measures and Activities (address applicable elements and identify the person/position responsible for each element)

- a. Provide adequate maintenance facilities and equipment
- b. Maintenance of a map of the collection system
- c. Management of information and use of timely, relevant information to establish and prioritize appropriate MOM activities and identify and illustrate trend in overflows (frequency and volume)
- d. Routine preventive operation and maintenance activities
- e. Identification and prioritization of structural deficiencies and identification and Implementation of short-term and long-term rehabilitation actions to address deficiencies
- f. Appropriate training on a regular basis
- g. Equipment and replacement parts inventories including identification of critical replacement parts.

5. Design and Performance Provision

- a. Requirements and standards for the installation of new sewers, pumps and other appurtenances, and rehabilitation and repair projects
- b. Procedures and specifications for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects

6. Monitoring, Measurement and Program Modifications

- a. Monitor the implementation and, where appropriate, measure the effectiveness of each element of your MOM program
- b. Update program elements as appropriate based on monitoring or performance evaluations

7. Overflow Emergency Response Plan (Plan must identify measures to protect public health and the environment)

- a. Ensure you are made aware of all overflow to the greatest extent possible.
- b. Ensure overflows are appropriately responded to, including reporting requirements
- c. Ensure appropriate immediate notification to the public, health agencies, and other impacted entities (i.e. water suppliers). Identify the public health and other officials who will receive immediate notification.
- d. Provide emergency operations

8. Communications. Communicate on the implementation and performance of the MOM program with interested parties as requested.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 18 2013

MEMORANDUM

SUBJECT: Assessing Financial Capability for Municipal Clean Water Act Requirements

FROM: Nancy Stoner
Acting Assistant Administrator
Office of Water (OW)

Cynthia Giles
Assistant Administrator
Office of Enforcement and Compliance Assurance (OECA)

TO: Regional Administrators
Regional Water Division Directors
Regional Enforcement Division Directors

We are working closely with local governments to clarify how the financial capability of a community will be considered when developing schedules for municipal projects necessary to meet Clean Water Act obligations. Our on-going conversations have been very encouraging and have helped identify several implementation issues, as well as more robust ways to present additional community-specific information within a financial capability analysis when considering a community's ability to achieve the shared goal of clean water. These issues are discussed in the attached financial capability framework document. We plan to develop an approach that addresses these issues in a way that achieves our shared goal of clean water. We expect to share a draft of the approach with you soon.

As we move forward, OW and OECA will continue to reach out to the Regions for your input and recommendations. If you have any questions, please contact one of us or have your staff contact Deborah Nagle, Director, Water Permits Division (nagle.deborah@epa.gov) or Mark Pollins, Director, Water Enforcement Division (pollins.mark@epa.gov).

cc: Randy Hill
Susan Shinkman
Lisa Lund
Deborah Nagle
Mark Pollins
Regional Permit and Enforcement Liaisons

Attachment

EPA's DIALOGUE WITH LOCAL GOVERNMENT FINANCIAL CAPABILITY FRAMEWORK

January 2013

Over the last several months, the U.S. Environmental Protection Agency (EPA) and local governments have engaged in a dialogue to clarify how the financial capability of a community will be considered when developing schedules for municipal projects necessary to meet Clean Water Act (CWA) obligations. This dialogue demonstrates EPA's strong support for ensuring that communities move forward in a sustainable manner and within their financial capability to meet CWA obligations. EPA is committed to ensuring that the policies reflected in this discussion are implemented consistently throughout EPA's Regional offices.

Local governments play a critical role in providing wastewater and stormwater infrastructure and services for their citizens, businesses and institutions. These municipal functions have been an important part of implementing the CWA to improve water quality and increased public health protection in streams, lakes, bays, and other waters nationwide. However, significant water pollution challenges remain. Elected officials remain strong supporters of the CWA goals and objectives by directing the public investment that is necessary to comply with the Act and to promote the quality of life for their citizens. Many local governments face complex water quality issues that are heightened by the need to address population growth, increases in impervious surfaces, source water supply needs, and aging infrastructure. In recent years, many local governments have increased their investment in their wastewater infrastructure by providing increased capital investments to rehabilitate existing systems, improve operation and maintenance and address additional regulatory requirements. As programs to improve water quality and attain CWA objectives are implemented, many state and local government partners find themselves facing difficult economic challenges. We recognize these challenging conditions and are working with states and local governments to develop and implement new approaches that will achieve water quality goals at lower costs and in a manner that addresses the most pressing problems first.

It is essential that long-term approaches to meeting CWA objectives are sustainable and within a community's financial capability. A community's financial capability and other relevant factors are important when developing appropriate compliance schedules that ensure human health and environmental protection. As EPA implements the recently released Integrated Municipal Stormwater and Wastewater Planning Approach Framework, EPA's "Combined Sewer Overflows: Guidance for Financial Capability Assessment and Schedule Development" (EPA 832-B-97-004) (Guidance for Financial Capability Assessment) will continue to be a valuable guide for evaluating the level of burden placed on a community by necessary clean water investments. Input from communities and others have pointed to a need to further clarify how financial capability is considered when developing schedules for municipal projects to meet their CWA obligations. In response, EPA is developing an approach to provide clarification of the financial capability analysis and that ensures consistent implementation among EPA Regions. The EPA's on-going conversations with communities and stakeholder groups have been very encouraging and are providing a deeper understanding of the fiscal impacts that regulatory

compliance has on consumers and households along the income distribution curve and on non-residential users. The flexibilities under the CWA, regulations, and EPA policies allow local government to continue to maintain existing wastewater and stormwater systems while making progress on clean water goals in a manner that is sustainable and within a community's financial capability. EPA and local government representatives will focus on the following topics associated with how a community's financial capability is assessed and considered when developing schedules to meet CWA objectives:

- How to expand the use of benchmark indicators of household, community and utility affordability, such as increasing arrearages, late payments, disconnection notices, service terminations, and uncollectable accounts;
- How to meet the obligations of the CWA by utilizing flexibilities in the statute and implementing regulations to prioritize necessary investments;
- How rate structures present both limitations and opportunities;
- How innovative financing tools, including public private partnerships, are related to affordability;
- How to facilitate consistent policy implementation at EPA Regional offices; and
- How other community specific factors, including obligations under the Safe Drinking Water Act, should be considered in developing appropriate compliance schedules

Prioritizing Investments

As articulated in the Integrated Planning Approach Framework, EPA encourages municipalities to balance CWA requirements in a manner that addresses the most pressing health and environmental protection issues first. For communities that have CWA responsibilities for stormwater and the collection and treatment of wastewater, it is entirely appropriate to consider the financial impacts of investments they need to make to manage both stormwater and wastewater discharges. EPA continues to explore ways in which the integrated planning approach can provide for meeting water quality standards and other CWA obligations by utilizing existing flexibilities in the CWA and its implementing regulations, policies and guidances.

Low Income Households

Uniform rate structures may place a disproportionately high financial burden on households with low incomes. EPA strongly encourages municipalities to consider establishing lower rates or subsidies for low income customers. This is consistent with one of the goals of integrated planning, which is to take advantage of synergies and savings that can be found through an integrated approach and thereby promote affordability.

Some communities have asked whether the CWA restricts a community's ability to set different rate structures to address such burdens or would limit their ability to receive grant funding from the Agency.¹ EPA plans to discuss both the limits and opportunities that different rate structures present for achieving clean water goals. Local officials have a great deal of latitude under these

¹ Section 204(b)(1) of the CWA recognizes the use of lower charges for low-income residential users as satisfying the stipulation that recipients of services must pay their proportionate share. The EPA's regulations at 40 C.F.R. Section 35.2140(i) reflect this and authorize low income residential user rates.

regulations and the EPA continued to encourage communities to consider and adopt rate structures that ensure that lower income households continue to be able to afford vital wastewater services. Several areas of discussion concerning rate structure involve state law, bond covenants, and implementation considerations.

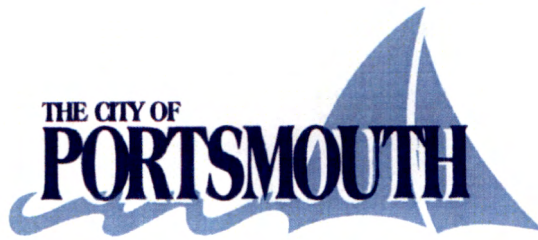
In addition, EPA's Guidance for Financial Capability Assessment provides a flexible framework for considering the site-specific factors that impact a given community's rate base. The guidance encourages communities to consider and present any other documentation of their unique financial circumstances, so that it may be considered as part of the analysis. Where communities have adopted differential rates for low income customers, the income distribution that led to that approach may be valuable supplemental information that the community would choose to present as part of its financial analysis when determining the appropriate timeframe for reaching compliance. Examples of information that have been used in this context include poverty rates, income distribution by quintile, late payments, disconnection notices, service terminations, uncollectable accounts and average wastewater bill as a percentage of the median household income (MHI), although any information that the community believes is relevant may be presented.

The Role of Median Household Income in Developing Compliance Schedules

The EPA's Guidance for Financial Capability Assessment suggests using the percentage of MHI as one indicator for helping to determine the schedule for completing necessary work. The MHI indicator presents only one of many considerations that should be evaluated in determining the most appropriate schedule. EPA expects that the full range of financial indicators as well as municipal-specific information will be considered when developing schedules. A common misconception is that the EPA requires communities to spend to a level of 2% of MHI to meet CWA obligations. Rather, the percent MHI calculation is guidance, and is considered along with a suite of other financial indicators to assess the overall burden on a community. The guidance recommends that communities with higher burdens be given longer time periods to complete the needed work.

Community Specific Factors

The EPA's Guidance for Financial Capability Assessment provides a flexible framework for considering the site-specific factors that impact a given community's rate base. The guidance encourages communities to consider and present any other documentation of their unique financial circumstances, so that it may be considered as part of the analysis.



February 27, 2015

Mr. Chuck Schadel
Environmental Scientist
U.S. EPA, Region III (3WP42)
1650 Arch Street
Philadelphia, PA 19103-2029
schadel.chuck@epa.gov

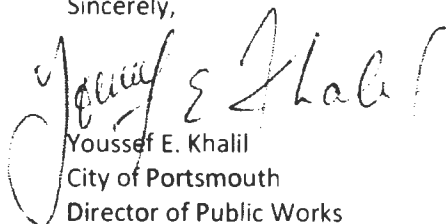
RE: Administrative Order for Compliance on Consent, Docket No. CWA-03-2015-0064DN,
NPDES Permit Number VA0088668

Dear Sir:

The City of Portsmouth is pleased to submit the required Plan for Compliance ("the Plan"), as ordered in the referenced Administrative Order for Compliance on Consent. The Plan addresses corrective actions as agreed upon by the City and the U.S. EPA.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Sincerely,


Youssef E. Khalil
City of Portsmouth
Director of Public Works

cc: James E. Wright, Jr., P.E., CSM, City Engineer
Jeffrey S. Miller, Esquire – Assistant City Attorney
Diane Quick – Manager of Operations/Stormwater

CITY OF PORTSMOUTH
AOCC IMPLEMENTATION PLAN

- a) *Identify unauthorized non-stormwater discharges and/or improper disposal by field screening segments of the MS4.*

2008 Multi-Sector General Permit (MSGP) expired on September 29, 2013. The new permit to replace it has not been issued. The 2008 MSGP has been administratively continued. The proposed 2013 MSGP has not been finalized. The pending MSGP was used to identify the new sampling parameters for the Illicit Discharge Control Program, Dry-Weather Sampling in order to prevent changes once the 2013 MSGP becomes final.

The proposed new parameters are:

PARAMETER	BENCHMARK
Potassium	20.0 mg/L
Ammonia	2.14 mg/L
Phenol	0.26 mg/L
Hardness (as CaCO ₃ 100 mg/L)	Used to benchmark Copper

Potassium benchmark not in MSGP; parameter obtained from Center for Watershed Protection IDDE Guidance Manual referenced on EPA website. Ammonia to Potassium ratio can be used to distinguish possible wastewater contamination from washwater contamination.

HARDNESS (mg/L)	COPPER (mg/L)
0-24.99	0.0038
25-49.99	0.0056
50-74.99	0.0090
75-99.99	0.0123
100-124.99	0.0156
125-149.99	0.0189
150-174.99	0.0221
175-199.99	0.0253
200-224.99	0.0285
225-249.99	0.0316
250+	0.0332

NEXT STEPS

Get approval from DEQ for new parameter limits.
Purchase new test kits.
Train staff on new field procedures.
Implement modified field program.
Begin sampling Summer 2015.

b) *Improved tracking and elimination of illicit discharges.*

The database for tracking complaints for illicit discharges will be maintained the Department of Public Works – Stormwater Compliance Division.

- The Department of Public Works receives complaints concerning illicit discharges via phone call, email, webpage, etc.
- Complaints are entered into a database.
- The complaints are provided to both Stormwater Operations and Stormwater Compliance staff for investigation.
- Information from the investigations is entered into the database.
- If there is no merit to the complaint, then it is noted as such in the database and no additional action is required.
- If there is an illicit discharge, staff action is noted – onsite meeting, educational material, violation notice, etc. Staff action is based on the nature of the violation.
- If a follow-up inspection is required, then it is noted in the database and prioritized based upon the magnitude and nature of the suspected discharge, sensitivity of the receiving waters, and other relevant factors. The results of the follow up inspection and any subsequent actions are noted in the database.

NEXT STEPS

Train staff on new SOP.
Provide EPA with a sample from database for review.
Modify SOP database as necessary.

c) *Provide enhanced outreach activities for commercial and industrial sites of concern by educating businesses that are most likely to have stormwater issues.*

- Use Zoning maps, development plans, and staff knowledge to identify industrial and commercial corridors.
- Overlay new FEMA flood maps to identify those areas in a flood zone.

- Use information from complaints (discharges, flooding, etc.) to focus in on "hot spot" areas. "Hot spot" areas are locations where complaints overlap with multiple layers in the GIS indicating possible stormwater issues such as industrial/commercial corridors, flood zones, problematic drainage basins, etc.
- Identify potential "facilities" of concern within these "hot spot" areas. "Facilities" are historic bad actors, types of businesses that can be prone to stormwater issues, businesses that have potential to be bad actors due to their method of operation, etc.
- Provide these "facilities" with good housekeeping literature on a quarterly basis.
- Provide Fire Marshal staff with targeted stormwater training.
- Provide Fire Marshal with a list of "facilities" that have received the literature.
- Fire Marshal shall conduct inspections on 25% of these facilities annually.
- Stormwater Compliance staff shall review inspections by Fire Marshal to determine effectiveness of literature.
- Additional action may be required for "facilities" where problems are identified. Typical actions – provide stormwater training materials, additional inspections by stormwater compliance staff, violation notice, etc.

NEXT STEPS

Conduct training for Fire Marshal staff.

Perform mapping and cross-reference with complaints to determine "hot spots".

Identify "facilities".

Provide sample map and "facility" selection to EPA.

Provide good housekeeping materials to "facilities".

Provide list of "facilities" to Fire Marshal staff.

Coordinate inspection schedule with Fire Marshals.

Implement program.

d) Perform inspections of Municipal Operations.

The City of Portsmouth uses one of its stormwater annual service consultants to conduct quarterly inspections of its municipal operations. Inspection reports are added to the SWPPP for each facility and provided to the "responsible person" for each facility to provide corrective actions. Stormwater Compliance staff re-inspects with "responsible person" after 30 days to verify corrective actions.

NEXT STEPS

Program is already in place; continue with program.

e) Install retrofit of decanting facility at Frederick Boulevard Operations Facility to include (1) reconfiguring decanting bins for street sweeper and vactor debris such that material and debris would remain in the bins and water would filter out; (2) installing a bioswale (designed for a 10-year storm using the BMP Clearinghouse) between decanting operations and the outfall ditch; and (3) install a filtering mechanism between the bins and the bioswale.

- Set up design task order with stormwater annual service consultant.
- Start design for facility.
- At 90% plans, submit plans for City site plan review and share plans with EPA.
- Proceed with procurement after site plan approval.
- Award contract and construct facility in accordance with approved design.

NEXT STEPS

Start process above.